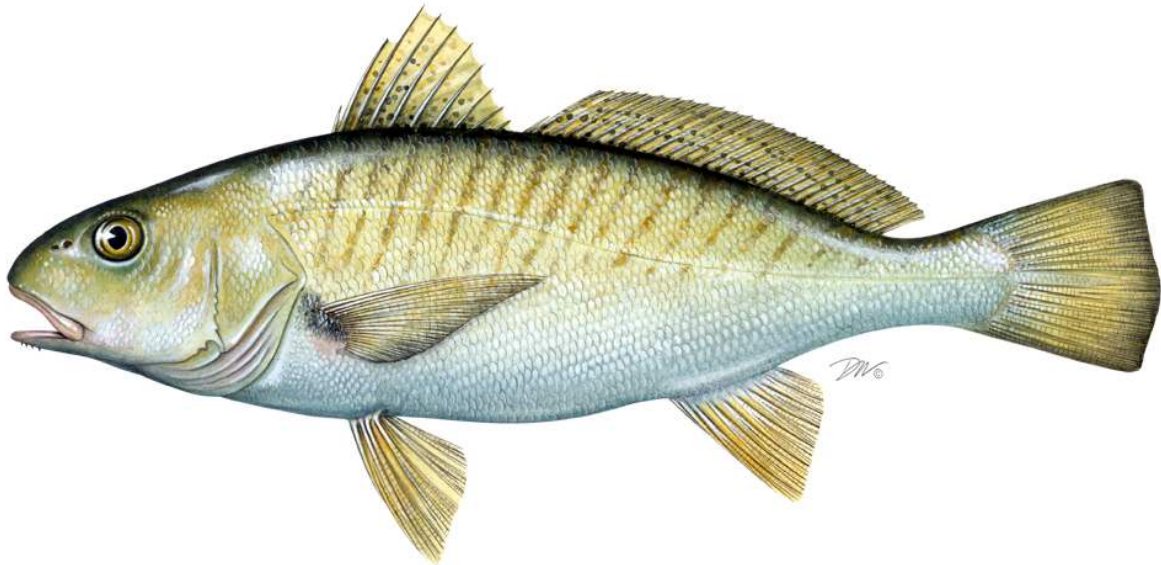


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2012 REVIEW OF THE
ATLANTIC STATES MARINE FISHERIES COMMISSION
FISHERY MANAGEMENT PLAN FOR

ATLANTIC CROAKER
(Micropogonias undulatus)

2011 FISHING YEAR



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I. Status of the Fishery Management Plan

<u>Date of FMP Approval:</u>	Original FMP – October 1987
<u>Amendments:</u>	Amendment 1 – November 2005 (implemented January 2006) Addendum I – March 2011
<u>Management Areas:</u>	The Atlantic coast distribution of the resource from New Jersey through Florida
<u>Active Boards/Committees:</u>	South Atlantic State/Federal Fisheries Management Board; Atlantic Croaker Technical Committee, Stock Assessment Subcommittee, and Plan Review Team; South Atlantic Species Advisory Panel

The Fishery Management Plan (FMP) for Atlantic Croaker was adopted in 1987 and included the states from Maryland through Florida (ASMFC 1987). Subsequently, the South Atlantic State/Federal Fisheries Management Board (Board) reviewed the FMP and found its recommendations to be vague and recommended that an amendment be prepared to define management measures necessary to achieve the goals of the FMP. The Interstate Fisheries Management Program Policy Board also adopted the finding that the original FMP did not contain any management measures that states were required to implement.

In 2002, the Board directed the Atlantic Croaker Technical Committee to conduct the first coastwide stock assessment of the species in preparation of developing an amendment. The Atlantic Croaker Stock Assessment Subcommittee developed a stock assessment in 2003, which was approved by a Southeast Data Assessment Review (SEDAR) panel for use in management in June 2004 (ASMFC 2005a). The Board quickly initiated the development of an amendment. In November 2005, the Board approved Amendment 1 to the Atlantic Croaker FMP (ASMFC 2005b). The amendment was fully implemented by January 1, 2006.

The goal of Amendment 1 is to utilize interstate management to perpetuate the self-sustainable Atlantic croaker resource throughout its range and generate the greatest economic and social benefits from its commercial and recreational harvest and utilization over time. Amendment 1 contains four objectives:

- 1) Manage the fishing mortality rate for Atlantic croaker to provide adequate spawning potential to sustain long-term abundance of the Atlantic croaker population.
- 2) Manage the Atlantic croaker stock to maintain the spawning stock biomass above the target biomass levels and restrict fishing mortality to rates below the threshold.
- 3) Develop a management program for restoring and maintaining essential Atlantic croaker habitat.
- 4) Develop research priorities that will further refine the Atlantic croaker management program to maximize the biological, social, and economic benefits derived from the Atlantic croaker population.

Amendment 1 expanded the management area to include the states from New Jersey through Florida. Consistent with the stock assessment completed in 2004, the amendment defined two Atlantic coast management regions: the south-Atlantic region, including the states Florida

through South Carolina; and the mid-Atlantic region, including the states North Carolina through New Jersey.

Amendment 1 established biological reference points (BRPs) to define overfished and overfishing stock status for the mid-Atlantic region only. Reliable stock estimates and BRPs for the South Atlantic region could not be developed during the 2004 stock assessment due to a lack of data. The BRPs were based on maximum sustainable yield (MSY), and included threshold and target levels of fishing mortality (F) and spawning stock biomass (SSB): F threshold = F_{MSY} (estimated to be 0.39); F target = $0.75 \times F_{MSY}$ (estimated to be 0.29); SSB threshold = $0.7 \times SSB_{MSY}$ (estimated to be 44.65 million pounds); and SSB target = SSB_{MSY} (estimated to be 63.78 million pounds). An SSB estimate below the SSB threshold results in an overfished status determination, and an F estimate above the F threshold results in an overfishing status determination. The Amendment established that the Board would take action, including a stock rebuilding schedule if necessary, should the BRPs indicate an overfished stock or a stock subject to overfishing.

Amendment 1 did not require any specific measures restricting recreational or commercial harvest of Atlantic croaker. States with more conservative measures were encouraged to maintain those regulations (Table 1). Through adaptive management, the Management Board may revise Amendment 1, and regulatory and/or monitoring requirements could be included in the resulting addendum, along with procedures for determining de minimis status and implementing alternative management programs via conservation equivalency.

The Board initiated Addendum I to Amendment I at its August 2010 meeting, following the updated stock assessment, in order to address the proposed reference points and management unit. The stock assessment evaluated the stock based on a coastwide unit, rather than the two management units established within Amendment I. In approving the final Addendum I, the Management Board approved the consolidation of the stock into one management unit, as proposed by the stock assessment. In addition, Addendum I established a procedure, similar to other species, by which the Board may approve peer-reviewed BRPs without a full administrative process, such as an amendment or addendum.

Addendum I did not add or change any additional management measures or requirements. The only existing requirement is for states to submit an annual compliance report by July 1 of each year that contains commercial and recreational landings as well as results from any monitoring programs that intercept Atlantic croaker.

II. Status of the Stock

Stock status is based on the data and results of the 2010 stock assessment (ASMFC 2010). Results include revised biological reference points (below). These reference points are ratio-based and apply to the entire coastwide resource (unlike those in Amendment 1). Overfishing is occurring if F/F_{MSY} is greater than 1 and the stock is considered overfished if $SSB/(SSB_{MSY}(1-M))$ is less than 1.

	Overfishing Definition	Overfished Definition
Target	$F/(F_{MSY} * 0.75) = 1$	$SSB/SSB_{MSY} = 1$
Threshold	$F/F_{MSY} = 1$	$SSB/(SSB_{MSY}(1-M)) = 1$

Atlantic croaker is not experiencing overfishing. Biomass has been increasing and fishing mortality decreasing since the late 1980s. Biomass conclusions are based on information from the data compiled for the assessment, namely increasing indices of relative abundance and expanding age structure in the catch and indices. Model estimated values of fishing mortality (F), spawning stock biomass (SSB), and biological reference points are too uncertain to be used to determine stock status. However, the ratio of F to F_{MSY} (the F needed to produce maximum sustainable yield) is reliable and can be used to determine that overfishing is not occurring. It is not possible to be confident with regard to stock status, particularly a biomass determination, until the discards of Atlantic croaker from the South Atlantic shrimp trawl fishery can be adequately estimated and incorporated into the stock assessment.

Absolute estimates of total F are unavailable because of model uncertainty; however, the general trend in total F from the model is considered reliable due to support from the data. The trend in total F decreases substantially during the first five years of the time series (1988-1992) and shows an overall decline over the remainder of the time series, except for occasional, brief spikes (Figure 1). Retrospective analysis of the model showed that estimates of F decreased as more years of data were used. A series of sensitivity runs conducted over a range of plausible values of shrimp-trawl fishing mortality found that the ratio of directed fishing mortality to F_{MSY} was less than one in all cases, indicating overfishing was not occurring.

Absolute estimates of SSB are unavailable because of model uncertainty; however, the general trend in SSB from the model is considered reliable due to support from the data. Spawning stock biomass shows a nearly consistent increasing trend since 1998 (Figure 2). Sensitivity runs of the model, including rough estimates of shrimp trawl discards, do not change the overall trend in SSB. Retrospective analysis of the model showed that estimates of SSB increased as more years of data were used.

Recruitment, estimated in the model as age-1 abundance, has been variable but generally increasing over the time series. Figure 2 shows the trend in recruitment; absolute values are omitted because of uncertainty in abundance estimates. The model estimated the production of strong year classes in 1997, 2001, and 2007.

III. Status of the Fishery

Total Atlantic croaker harvest from New Jersey through the east coast of Florida in 2011 is estimated at 14.8 million pounds (Tables 1 and 2, Figure 3). This represents a 64 percent decline in total harvest since the peak at 41.2 million pounds in 2001 (60% commercial decline, 75% recreational decline). The commercial and recreational fisheries harvested 81 and 19 percent of the total, respectively. The vast majority of landings are from the Mid-Atlantic region (98% in 2011), and the recent decline in total landings is a result of both commercial and recreational landings declines in that region, although some states showed increases in either or both sectors (Figure 4). Commercial and recreational landings in the South Atlantic region have been generally stable over the last decade; however, 2010 showed large decreases in the recreational

harvest of the South Atlantic states' fisheries, though nothing of the same magnitude as in the Mid-Atlantic states. Recreational harvests in the South Atlantic region rebounded to previous levels in 2011.

Atlantic coast commercial landings of Atlantic croaker exhibit a cyclical pattern, with low domains in the 1960s to early 1970s and the 1980s to early 1990s, and high domains in the mid-to-late 1970s and the mid-1990s to the present (Figure 3). This cyclical pattern was noted in the recent 2010 stock assessment, noting that the 50-year time series follows this pattern and that the current trend has been towards a low. Commercial landings increased from a low of 3.7 million pounds in 1991 to 30.1 million pounds in 2001 (Table 2); however, landings have declined consistently since 2003 to 11.9 million pounds in 2011, which registers below the 1960-2011 average of 13.6 million pounds. Within the management unit, the majority of 2011 commercial landings came from Virginia (46%) and North Carolina (43%). Maryland had the next highest level, with 6% of the coastwide landings.

From 1981-2011, recreational landings of Atlantic croaker from New Jersey through Florida have varied between 2.8 million fish (1.3 million pounds) and 13.2 million fish (11.1 million pounds; Tables 3 and 4, Figure 5). Landings general increased until 2001 before exhibiting a declining trend through 2011. The 2011 landings are estimated at 5.0 million fish and 2.7 million pounds, continuing the decline from 2010. Virginia was responsible for 68% of the 2011 recreational landings, in numbers of fish, followed by Maryland (9%), and Florida (7%). The number of recreational releases has increased over the time series, although continued a decreasing trend since 2007 (Figure 5). In 2011, anglers released 8.0 million fish, which is less than the ten-year (2001-2010) average of 11.9 million fish (Table 5). Anglers released an estimated 62% of the croaker catch in 2011 (Figure 5).

IV. Status of Assessment Advice

A statistical catch-at-age (SCA) model was used in the last Atlantic croaker stock assessment (ASMFC 2010). This model combines the catch-at-age data from the commercial and recreational fisheries with information from fishery-independent surveys and biological information such as growth rates and natural mortality rates to estimate the size of each age class and the exploitation rate of the population. The assessment was peer reviewed by a panel of experts in conjunction with the Southeast Data, Assessment, and Review (SEDAR) process.

The Review Panel was unable to support some of the assessment results due to uncertainty regarding the estimation of Atlantic croaker discards in the shrimp trawl fishery, and the application of estimates in modeling. Specifically, model-estimated values of stock size, fishing mortality, and biological reference points are too uncertain for use; however, the trends in model-estimated parameters and ratio-based fishing F reference points are considered reliable. Adequate discard estimates cannot be developed from currently available data, and assessments of Atlantic croaker will be unreliable until adequate estimates are properly incorporated into modeling. Despite the uncertainty in assessment results caused by shrimp trawl bycatch, the Review Panel concluded that it is unlikely that the stock is in trouble. The stock is not experiencing overfishing, biomass has been trending up, commercial catches are stable, and discards from the shrimp trawl fishery have been much reduced.

V. Status of Research and Monitoring

There are no research or monitoring programs required of the states except for the submission of an annual compliance report. The following fishery-dependent (other than catch and effort data) and fishery-independent monitoring programs were reported in the 2012 compliance reports.

Fishery-Dependent Monitoring

- New Jersey: commercial fishery biological sampling since 2006 (274 length measurements and otolith ages in 2011)
- Maryland: commercial pound net fishery biological sampling (1,886 length measurements, 245 otoliths collected in 2011), at-sea sampling supplemented with dealer sampling beginning in 2009 (365 length and weight measurements in 2011); Maryland Charter Boat CPUE (1993-present; 2011 CPUE fell from 2010 but still above time-series mean)
- Virginia: commercial fishery biological sampling (5,822 length and weight measurements, 425 otolith ages, and 707 sex determinations in 2011)
- North Carolina: commercial fishery biological sampling since 1982 for length (2011 n = 7,098), weight (2011 n = 14,829), otolith, sex determination, and reproductive condition
- South Carolina: recreational fishery biological sampling via state finfish survey (108 length measurements in 2011)
- Georgia: recreational fishery biological sampling via carcass collections (11 fish in 2011)
- Florida: commercial fishery biological sampling (41 length measurements in 2011)

Fishery-Independent Monitoring

- New Jersey: nearshore ocean (within 12 nm) juvenile trawl surveys (1988-present; 2011 CPUE well above time-series average; nearshore Delaware Bay juvenile trawl survey (1991-present; 2011 CPUE low and below time-series average); Delaware River juvenile seine survey (1980-present; 2011 CPUE low and below time-series average)
- Delaware: offshore Delaware Bay adult finfish trawl survey (1966-present; 2011 n = 1,158; 49% increase in catch per nm towed over 2010 but still below time-series mean); nearshore Delaware Bay and River juvenile finfish trawl survey (1980-present; 2011 index (geometric mean) declined 74% from 2010 and fell below time-series mean)
- Maryland: Atlantic coast bays juvenile otter trawl survey (standardized from 1989-present); Chesapeake Bay juvenile trawl survey (standardized from 1989-present; 2011 CPUE increased from 2010 but still 10th lowest in time series); incidental catches in Maryland coastal bays juvenile seine survey (1972-present) and Chesapeake Bay juvenile seine survey (1959-present; 2011 indices increased or were stable relative to 2010)
- Virginia: VIMS Juvenile Finfish and Blue Crab Trawl Survey (1988-present; 2011 index value declined 68.5% from the 2010 value and 85% lower than the previous 3-year mean)
- North Carolina: Pamlico Sound juvenile trawl survey (1987-present; 2011 juvenile abundance index dropped by nearly 90% from 2010 and fell below time-series mean)
- South Carolina: estuarine electroshock survey for juveniles (1991-present; 2011 CPUE increased 36% but remained below time-series mean); SEAMAP shallow water (15-30 ft) trawl survey from Cape Hatteras to Cape Canaveral (1989-present; 2011 CPUE increased by 147% from 2010); inshore estuarine trammel net survey for adults (May-September, 1991-present; 2011 CPUE increased 72% from 2010, reversing decline seen from 2009 to 2010)

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- Georgia: Marine Sportfish Population Health Survey (trammel and gill net, 2002-present; 2011 n = 125); Ecological Monitoring Survey (trawl, 2003-present; 2011 n = 15,733; CPUE declined by 44% from 2010)
- Florida: juvenile seine survey (1996-present; 2011 index continued variable trend with a decrease from 2010); juvenile trawl survey (2002-present; 2011 index continued variable trend with a decrease from 2010); adult haul seine survey (2001-present; 2011 index value continued overall increasing trend from 2001)

The Northeast Fishery Science Center's groundfish trawl survey also samples croaker from New Jersey to Cape Hatteras. Researchers from various agencies and institutions have conducted numerous studies on Atlantic croaker. Research topics include, but are not limited to: environmental effects on recruitment, population modeling, genetic stock identification, geographic variation in life history/populations dynamics, scale-otolith age comparisons, habitat preference, and bycatch reduction gear research.

Ageing Workshop

An Atlantic Croaker Ageing Workshop was held in October 2008. Conducting a workshop to standardize the otolith sectioning and ageing procedures and the current age dataset had been a longstanding research need for Atlantic croaker, especially prior to the 2010 benchmark assessment. Representatives from New Jersey, Maryland, Virginia, North Carolina, South Carolina, Georgia and the Gulf Council attended the workshop. The resulting standardized ageing procedure was published in an ASMFC reference document, with some states having already incorporated ageing instructions into their references.

VI. Status of Management Measures and Issues

Fishery Management Plan

Amendment 1 was fully implemented by January 1, 2006, and provided the management plan for the 2009 fishing year. There are no interstate regulatory requirements for Atlantic croaker. Should regulatory requirements be implemented in the future, all state programs must include law enforcement capabilities adequate for successfully implementing the regulations. Addendum I to Amendment 1 was initiated in August 2010 and approved in March 2011, in order to 1) revise the biological reference points to be ratio-based, and 2) remove the distinction of two regions within the management unit, based on the results of the 2010 stock assessment.

De Minimis Requests

States are permitted to request *de minimis* status if, for the preceding three years for which data are available, their average commercial landings or recreational landings (by weight) constitute less than 1% of the coastwide commercial or recreational landings for the same three year period. A state may qualify for *de minimis* in either its recreational or commercial sector, or both, but will only qualify for exemptions in the sector(s) that they qualify for as *de minimis*. Amendment 1 does not include any compliance requirements other than annual state reporting, which is still required of *de minimis* states, thus *de minimis* status does not exempt states from any measures.

In the annual compliance reports, the following states requested *de minimis* status: Delaware (commercial fishery), South Carolina (commercial fishery), Georgia (commercial and recreational fisheries), and Florida (commercial fishery). The commercial and recreational *de*

minimis criteria for 2011 are based on 1% of the average coastwide 2009-2011 landings in each fishery: 142,395 pounds for the commercial fishery and 41,536 pounds for the recreational fishery. The Delaware commercial fishery qualifies for *de minimis* status with an average of 11,209 pounds. The South Carolina commercial fishery qualifies for *de minimis* status with an average of 41 pounds. The Georgia commercial and recreational fisheries qualify for *de minimis* status with averages of less than 1,000 pounds (confidential) and 19,911 pounds, respectively. The Florida commercial fishery qualifies for *de minimis* status with an average of 38,030 pounds.

Bycatch Reduction

Atlantic croaker is subject to both direct and indirect fishing mortality. Historically, croaker ranked as one of the most abundant species in the bycatch of the south Atlantic shrimp trawl fishery. As a result, the original FMP recommended that bycatch reduction devices (BRDs) be developed and required in the shrimp trawl fishery. Since then the states of North Carolina through Florida have all enacted requirements for the use of BRDs in shrimp trawl nets in state waters, and croaker bycatch from this fishery has been reduced (ASMFC 2010). However, monitoring of bycatch and discards from this fishery is inadequate and results in the major source of uncertainty for assessing this stock, as well as other important Mid- and South Atlantic species. Most of the discarded croakers are age-0 and thus likely have not yet reached maturity (ASMFC 2010). North Carolina Department of Marine Fisheries has secured funding for a two-year study, beginning in 2012, to collect bycatch data from state shrimp trawlers. These data will be valuable for incorporating estimates of removals in the next stock assessment.

Atlantic croaker are also discarded from other commercial fishing gears. This is primarily due to market pressures and few restrictions on croaker harvest at the state level. The NMFS Pelagic Observer Program provides data to estimate these discards for use in assessments; however, the time series is limited and only discards from gill nets and otter trawls could be estimated for the last assessment based on the available data. Since 1988, estimated discards have fluctuated between 94 and 15,176 mt without trend, averaging 2,503 mt (ASMFC 2010).

Atlantic croaker has also been a major component of the scrap/bait fishery. Landings from this fishery are not reported to the species level, except for North Carolina, which has a continuous program in place to sample the landings and enables estimating scrap landings of croaker for use in the stock assessment. As part of the recent stock assessment, North Carolina estimated the scrap/bait landings, which have declined in recent years, from a high of 1,569 mt in 1989 to a low of 84 mt in 2008, primarily due to restrictions placed on the fisheries that produced the highest scrap/bait landings (ASMFC 2010). Several of the regulations instituted by North Carolina include a ban on flynet fishing south of Cape Hatteras, incidental finfish limits for shrimp and crab trawls in inside waters, minimum mesh size restrictions in trawls, and culling panels in long haul seines. Monitoring programs are needed to account for bait/scrap landings in other states.

Several states have implemented other commercial gear requirements that further reduce bycatch and bycatch mortality, while others continue to encourage the use of these BRD devices. NOAA Fisheries recently published a notice on June 24, 2011 for public scoping in the Federal Register to expand the methods for reducing bycatch interactions with sea turtles, which may have additional effects on the bycatch of finfish like Atlantic croaker in trawls (76 FR 37050).

Continuing to reduce the quantity of sub-adult croaker harvested should increase spawning stock biomass and yield per recruit.

Atlantic croaker are also subject to recreational discarding. The number of Atlantic croaker released alive by recreational anglers has generally increased over time. Ten percent of croakers released alive were estimated to die as a result of being discarded for the last stock assessment (ASMFC 2010). The use of circle hooks and appropriate handling techniques can help to reduce mortality of released fish.

Trigger Exercises

Amendment 1 requires the Technical Committee to conduct stock assessments every five years unless prompted by the annual trigger exercise. The primary hard trigger is based on landings data; however, catch-per-unit-effort (CPUE) will become the premier trigger when the quality and quantity of these data improve. A stock assessment will be triggered if the most recent year's commercial or recreational landings are less than 70% of the previous two years' average landings (ASMFC 2005b).

In 2011, the recreational landings dropped to 55.8% of the previous two-year average, triggering a stock assessment update or benchmark. The Atlantic Croaker Technical Committee reviewed the triggers, as well as discussed development of new triggers as tasked by the Board, at its June 2012 meeting in Charleston, South Carolina. While the commercial and recreational landings, along with the estimates of landings per unit effort, have shown decreases, the fishery-independent indices have not indicated major issues with the stock. Based on the available data and benefits and disadvantages of performing an update to the stock assessment, the Technical Committee recommended the Board not perform an assessment but rather allow the Technical Committee to further develop new assessment/management triggers. The 2012 Atlantic Croaker Trigger Report further details the Technical Committee's recommendations.

VII. Implementation of FMP Compliance Requirements for 2011

The PRT finds that all states have fulfilled the requirements of Amendment 1.

VIII. Recommendations

Management and Regulatory Recommendations

- Encourage the use of circle hooks to minimize recreational discard mortality.
- Consider approval of the *de minimis* requests from Delaware, South Carolina, Georgia, and Florida.
- Consider the basic research and monitoring information needed for informed management in light of the budgetary constraints limiting all state governments
- Support the Technical Committee's recommendation to develop new assessment/management triggers for use in management by the Board

Research and Monitoring Recommendations

High Priority

- Develop and implement compatible and coordinated sampling programs for the South Atlantic shrimp trawl fishery in order to monitor and characterize Atlantic croaker bycatch in this fishery.

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- Continue fisheries-independent surveys throughout the species range, with increased focus on collecting subsamples in the southern range
- Encourage fishery-dependent biological sampling, with increased focus in the southern range and expanding the commercial and recreational fishery samples to afford a full age-length key
- Determine migratory patterns and mixing rates through cooperative, multi-jurisdictional tagging studies; further studies on relative degree of genetic separation between fish in the northern and southern range of species; and continue research and analysis of otolith microchemistry data.
- Collect bio-profile information and conduct studies on growth rates, age structure, estimates of fecundity, and maturity schedule throughout the species range with a standardized protocol.
- Evaluate bycatch and discard estimates from commercial and recreational fisheries, and extend coverage of scrap fishery sampling to other states.
- Develop fishery-independent size, age, and sex specific relative abundance estimates to monitor long-term changes in croaker abundance.
- Maintain funding for current surveys and monitoring to provide needed information for stock monitoring and assessment

Medium Priority

- Develop age-size data that are representative of all seasons and areas in the fisheries on an annual basis.
- Improve catch and effort statistics from the commercial and recreational fisheries and develop more rigorous methods to standardize catch-per-unit-effort.
- Collect data on fishing attributes necessary to develop gear-type-specific fishing effort estimates.
- Evaluate commercial and recreational mortality under varying environmental factors and fishery practices and include in updated assessment.
- Update studies on the effectiveness of bycatch reduction devices (BRDs) in reducing croaker bycatch.
- Validate otolith aging methods with appropriate methods, e.g., tagging, chemical marking.
- Evaluate the optimum utilization (economic and biological) of a long-term fluctuating population such as croaker.
- Identify essential habitat requirements.
- Determine species interactions and predator/prey relationships for croaker (prey) and other more highly valued fisheries (predators).
- Determine the impacts of any dredging activity (i.e. for beach re-nourishment) on all life history stages of croaker.
- Investigate environmental covariates in stock assessment models.
- Examine socio-economic aspects of the fishery.
- Recover historical data in order to have landings data from NOAA at a finer scale
- Re-examine historical ichthyoplankton studies of the Chesapeake Bay for an indication of the magnitude of estuarine spawning.

IX. References

- Atlantic States Marine Fisheries Commission (ASMFC). 1987. Fishery Management Plan for Atlantic Croaker. Washington (DC): ASMFC. Fishery Management Report No. 10. 90 p.
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- ASMFC. 2010. Atlantic Croaker 2010 Benchmark Stock Assessment. Washington (DC): ASMFC. 366 p.

X. Figures

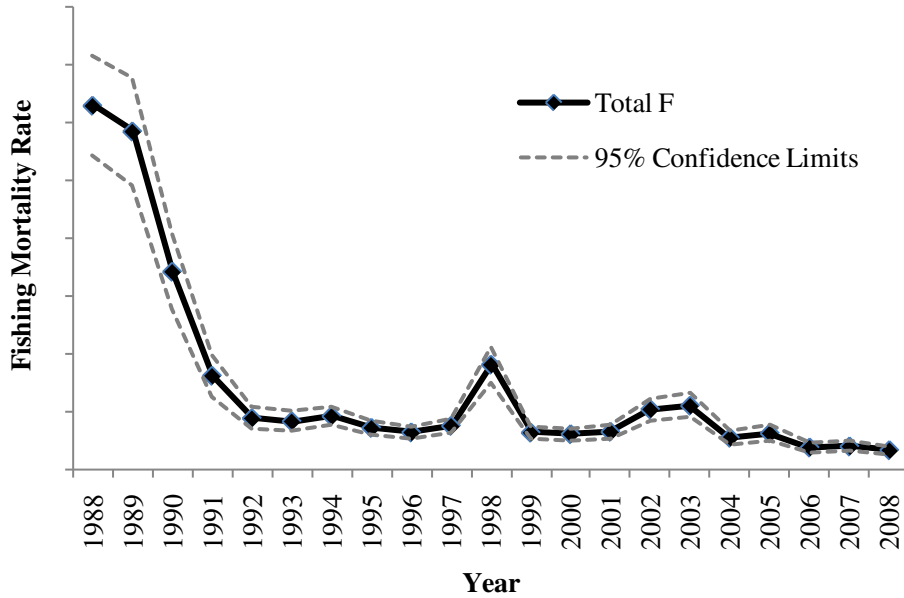


Figure 1. Trend in estimated total fishing mortality rate (F) of Atlantic croaker (Absolute estimates of F are unreliable because of uncertainty regarding the estimation of Atlantic croaker discards in the shrimp trawl fishery, and the application of estimates in modeling. Source: ASMFC 2010.)

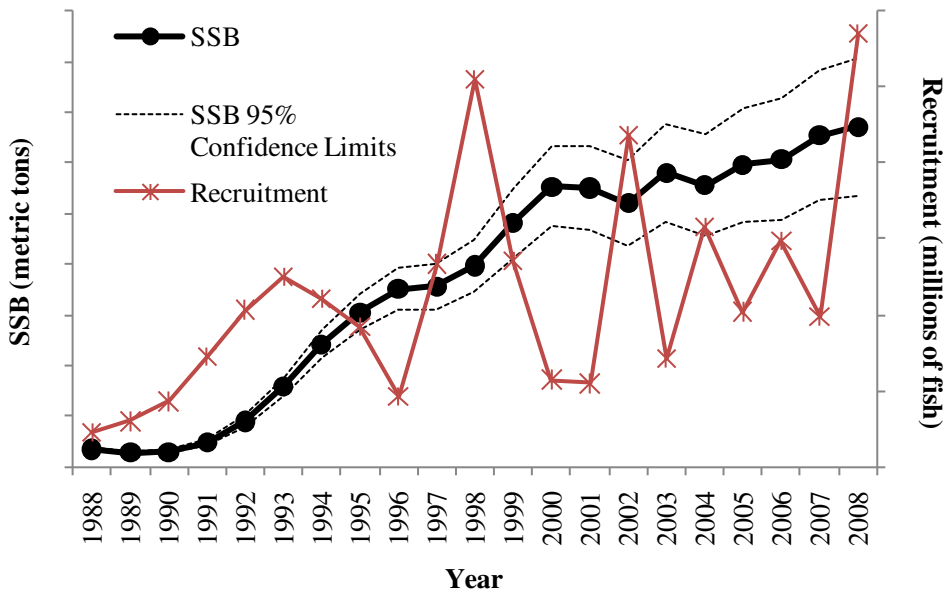


Figure 2. Trends in estimated spawning stock biomass (SSB, metric tons) and age-1 recruitment (numbers of fish) of Atlantic croaker (Absolute estimates of stock size are unreliable because of uncertainty regarding the estimation of Atlantic croaker discards in the shrimp trawl fishery, and the application of estimates in modeling. Source: ASMFC 2010.)

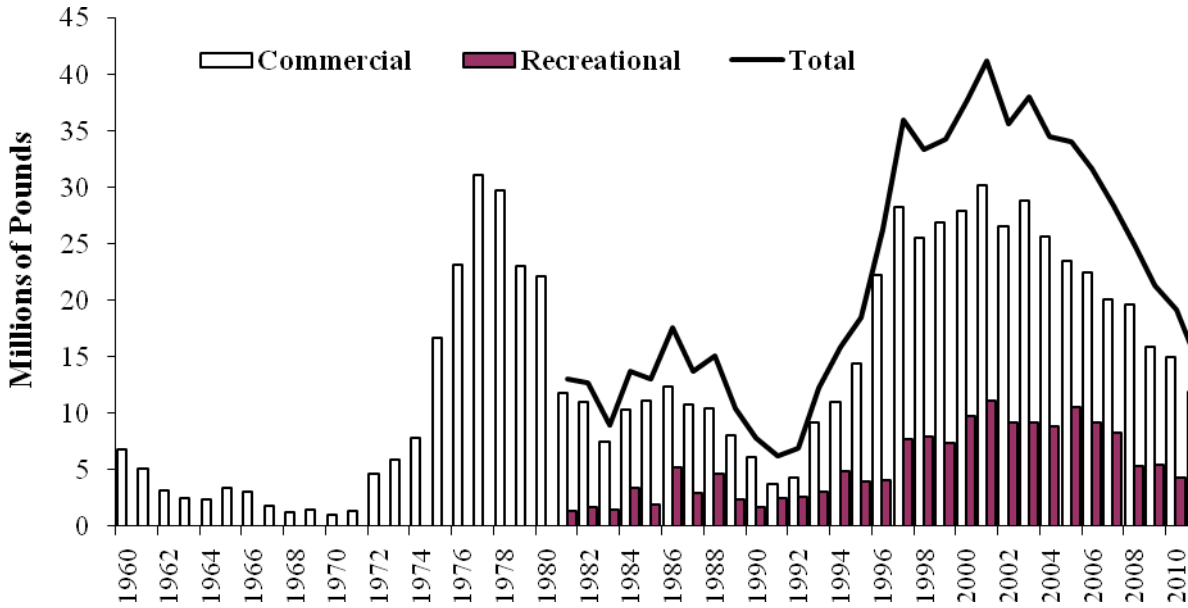


Figure 3. Atlantic croaker commercial, recreational, and total landings (pounds)
 (See Tables 2 and 3 for values and source information. Commercial landings estimate for 2011 is preliminary. Reliable recreational landings estimates are not available before 1981.)

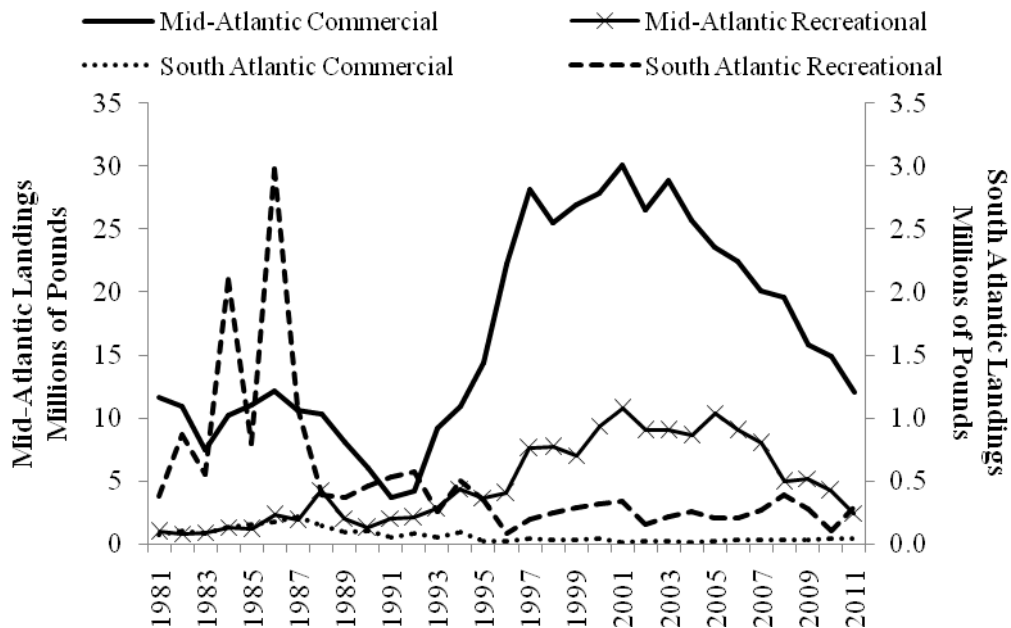


Figure 4. Mid-Atlantic (NJ-NC) and South Atlantic (SC-FL) landings (pounds)
 (See Tables 2 and 3 for values and source information.)

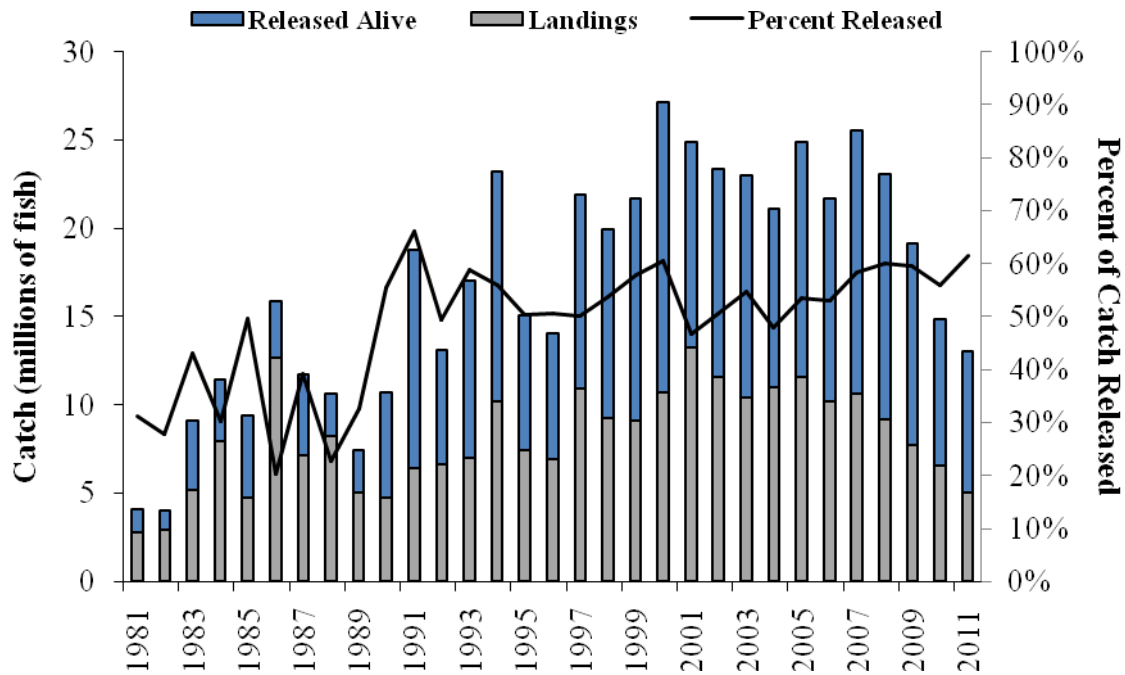


Figure 5. Recreational catch (landings and alive releases, in numbers) and the percent of catch that is released, 1981-2011
(See Tables 4 and 5 for values and source information.)

XI. Tables

Table 1. Summary of state regulations for Atlantic croaker in 2011*

State	Recreational	Commercial
NJ	none	otter/beam trawl mesh restriction for directed croaker harvest (>100 lbs in possession)
DE	8" minimum; recreational gill nets (up to 200 ft.) with license	8" minimum
MD	9" min, 25 fish/day, charter boat logbooks	9" minimum; open 3/16 to 12/31
PRFC	25 fish/day	pound net season: 2/25 to 12/15
VA	none	none
NC	recreational use of commercial gears with license and gear restrictions	
SC	mandatory for-hire logbooks	
GA	8" min, 25 fish/day	8" minimum; 25 fish/day limit except for shrimp trawls (no limit)
FL	none	none

* A commercial fishing license is required to sell croaker in all states with fisheries. For all states, general gear restrictions affect commercial croaker harvest.

Table 2. Commercial harvest (pounds) of Atlantic croaker by state, 1981-2011

(Estimates for 2010 are preliminary. Sources: state compliance reports; personal communication with ACCSP, Arlington, VA.)

Year	NJ	DE	MD	PRFC	VA	NC	SC	GA	FL	Total
1981	23,500	0	2,104	648	429,800	11,205,342	2,441	1,038	72,112	11,736,985
1982	100	0	7,091	188	119,300	10,824,953	386	2,177	95,357	11,049,552
1983	200	0	417	1,549	150,400	7,249,680	3,200	1,097	81,737	7,488,280
1984	57,700	0	27,072	73,701	817,700	9,170,775	3,793	434	131,375	10,282,550
1985	48,800	100	9,510	19,854	2,171,821	8,714,432	1,256		153,803	11,119,576
1986	106,000	500	135,922	99,373	2,367,000	9,424,828	924		173,531	12,308,078
1987	357,600	800	119,409	102,691	2,719,500	7,289,191	698	553	217,932	10,808,374
1988	30,100	200	98,855	12,796	1,749,200	8,434,415	2,614	304	140,033	10,468,517
1989	137,100	0	89,173	5,579	949,649	6,824,088	1,950		95,021	8,102,560
1990	644	42	2,473	5,115	201,353	5,769,512	1,190		104,402	6,084,731
1991	31,292	700	6,183	996	164,126	3,436,960	*		56,739	3,696,996
1992	51,600	800	17,050	17,692	1,339,353	2,796,612			79,040	4,302,147
1993	183,414	2,500	114,159	262,482	5,326,293	3,267,652	*		52,031	9,208,531
1994	117,256	3,000	158,918	240,271	5,759,975	4,615,754	*		96,018	10,991,192
1995	334,654	13,000	489,506	606,184	6,949,639	6,021,284	*		22,879	14,437,146
1996	621,889	9,681	792,326	1,427,285	9,409,904	9,961,834			26,045	22,248,964
1997	1,994,446	10,509	1,088,969	1,518,196	12,832,221	10,711,667	*		36,577	28,192,585
1998	1,029,332	10,368	1,006,529	610,885	11,898,586	10,865,897			26,418	25,448,015
1999	2,071,046	14,729	948,191	1,190,138	12,481,326	10,185,507			26,824	26,917,761
2000	2,130,465	11,121	902,379	1,812,130	12,822,400	10,122,627			37,953	27,839,075
2001	1,389,837	22,736	1,488,815	1,963,294	13,214,731	12,017,424		*	14,831	30,111,668
2002	1,828,484	10,732	894,879	1,421,094	12,133,834	10,189,153	*	*	17,191	26,495,367
2003	1,575,738	16,561	713,205	1,128,003	10,937,167	14,429,197	140	*	16,402	28,816,413
2004	2,067,992	32,729	1,354,982	1,631,596	8,550,574	11,993,003	*	*	11,413	25,642,289
2005	1,847,753	39,931	972,800	481,912	8,248,441	11,903,292	41	*	16,520	23,510,690
2006	1,617,144	19,277	466,833	670,276	9,293,410	10,396,554	160	*	30,272	22,493,926
2007	1,358,000	13,651	474,388	188,567	10,697,251	7,301,295	*		27,028	20,060,180
2008	946,062	10,465	592,211	337,062	11,925,676	5,791,874	116	*	31,560	19,635,026
2009	585,552	16,258	433,238	234,101	8,422,147	6,135,427	75	0	32,310	15,859,108
2010	342,116	6,024	490,067	163,371	6,574,894	7,312,159	3	0	36,882	14,925,516
2011	465,049	11,346	694,673	238,050	5,379,417	5,054,186	44	*	44,899	11,933,656

* confidential data

Table 3. Recreational harvest (pounds) of Atlantic croaker by state, 1981-2011

(Source: personal communication with NMFS Fisheries Statistics Division, Silver Spring, MD.)

Year	NJ	DE	MD	VA	NC	SC	GA	FL	Total
1981	582	2,317		535,297	426,240	67,284	9,665	305,547	1,346,932
1982			70,276	455,250	264,607	67,015	45,161	754,956	1,657,265
1983			32,053	486,006	395,402	14,158	25,412	510,599	1,463,630
1984			86,462	634,870	584,660	161,661	80,684	1,856,599	3,404,936
1985			17,169	843,414	278,214	72,780	40,421	684,449	1,936,447
1986		2,595	116,542	2,034,337	126,888	173,028	21,504	2,783,651	5,258,545
1987			191,628	1,306,814	352,346	64,696	14,947	1,005,053	2,935,484
1988		827	926,399	2,390,573	935,460	54,313	20,313	316,900	4,644,785
1989		284	19,189	1,329,680	658,567	80,580	21,138	268,335	2,377,773
1990		112	37,873	875,427	347,183	123,795	205,352	127,525	1,717,267
1991	4,264	10,972	117,210	1,728,021	157,660	16,173	54,116	460,453	2,548,869
1992		3,291	53,556	1,768,962	233,533	28,512	132,596	407,672	2,628,122
1993	844	9,641	476,866	1,993,915	282,910	18,005	55,604	180,517	3,018,302
1994	818	2,892	991,166	3,024,118	351,230	128,306	34,048	337,474	4,870,052
1995	9,515	82,864	567,149	2,675,381	326,135	25,386	20,862	301,918	4,009,210
1996	39,099	205,526	702,037	2,716,759	346,501	14,480	21,797	50,038	4,096,237
1997	278,758	340,198	1,117,999	5,522,195	309,457	53,863	26,272	113,096	7,761,838
1998	135,733	293,560	1,150,459	5,920,436	161,117	76,821	30,966	141,756	7,910,848
1999	301,957	522,201	1,024,398	4,969,283	212,991	26,356	32,375	231,692	7,321,253
2000	1,125,730	483,963	2,672,996	4,888,910	201,306	13,457	62,390	242,912	9,691,664
2001	1,132,214	304,127	1,278,699	7,674,759	355,009	10,750	7,844	320,487	11,083,889
2002	268,423	250,899	1,162,278	7,075,130	242,184	29,343	10,622	117,880	9,156,759
2003	682,698	262,114	2,069,176	5,674,111	317,606	59,399	71,881	79,396	9,216,381
2004	1,151,926	342,335	1,016,801	5,792,487	267,455	53,563	17,785	179,018	8,821,370
2005	1,189,849	846,084	942,702	7,240,971	143,963	42,088	13,913	147,117	10,566,687
2006	765,867	757,082	884,082	6,460,336	151,403	19,010	11,371	176,886	9,226,037
2007	409,392	334,850	1,056,471	6,111,612	87,013	39,368	13,624	207,821	8,260,151
2008	422,833	266,787	458,671	3,612,065	154,937	35,322	15,703	340,304	5,306,622
2009	79,405	206,238	1,048,153	3,708,788	123,901	39,112	27,831	209,821	5,443,249
2010	53,124	66,910	696,945	3,185,486	222,477	14,462	15,474	67,578	4,322,456
2011	29,234	84,145	356,339	1,837,183	119,935	128,963	16,428	146,101	2,718,328

Table 4. Recreational harvest (numbers) of Atlantic croaker by state, 1981-2011

(Source: personal communication with NMFS Fisheries Statistics Division, Silver Spring, MD.)

Year	NJ	DE	MD	VA	NC	SC	GA	FL	Total
1981	1,054	3,003	0	964,013	1,043,240	165,742	35,591	598,896	2,811,539
1982			10,452	273,039	596,493	193,554	169,749	1,682,619	2,925,906
1983			108,355	2,154,133	1,620,909	60,811	75,173	1,148,227	5,167,608
1984			211,035	2,047,720	2,147,871	588,114	202,364	2,781,742	7,978,846
1985			21,276	2,284,334	723,933	260,265	144,341	1,306,955	4,741,104
1986		4,694	123,578	6,384,966	356,742	599,442	69,887	5,118,552	12,657,861
1987	0	0	208,488	3,234,224	904,030	166,978	44,783	2,580,727	7,139,230
1988		1,186	1,005,452	4,048,690	2,256,128	144,057	64,093	685,778	8,205,384
1989		478	22,871	2,203,504	2,131,763	217,023	72,598	359,417	5,007,654
1990		281	100,673	2,374,679	1,063,452	346,631	585,380	304,064	4,775,160
1991	16,235	37,500	288,471	4,298,542	434,067	100,816	184,435	1,030,115	6,390,181
1992	0	9,854	117,427	4,524,040	723,823	74,051	440,185	754,595	6,643,975
1993	2,552	19,352	805,560	4,990,098	755,998	32,700	89,734	304,067	7,000,061
1994	1,567	5,718	1,633,581	6,494,691	1,179,735	188,520	102,974	599,032	10,205,818
1995	15,184	136,865	827,183	5,029,708	850,606	75,422	100,826	438,076	7,473,870
1996	35,037	235,389	775,115	4,997,021	662,240	37,464	61,957	116,575	6,920,798
1997	342,089	385,586	1,053,232	8,066,926	661,116	118,428	64,050	235,430	10,926,857
1998	143,404	391,231	1,126,058	6,730,181	387,427	170,528	64,953	234,360	9,248,142
1999	357,261	662,724	1,209,572	5,881,671	442,185	54,761	104,438	403,982	9,116,594
2000	1,023,442	517,886	2,674,880	5,486,159	391,056	32,332	128,922	455,870	10,710,547
2001	1,177,813	312,005	1,319,928	9,335,313	635,552	19,802	21,503	426,264	13,248,180
2002	253,472	261,634	1,223,385	9,129,060	408,944	66,409	36,497	177,751	11,557,152
2003	692,391	341,174	1,619,766	6,695,192	490,399	198,339	248,853	165,459	10,451,573
2004	1,172,210	494,104	870,844	7,292,880	474,180	135,842	44,825	497,921	10,982,806
2005	1,254,957	934,207	809,894	7,791,125	292,629	128,956	40,094	343,647	11,595,509
2006	698,428	863,288	833,190	7,069,449	434,735	38,682	40,378	247,383	10,225,533
2007	355,067	400,518	1,092,784	7,753,422	397,702	131,686	46,966	469,232	10,647,377
2008	475,373	349,229	689,154	6,524,884	372,778	100,460	45,598	636,050	9,193,526
2009	158,108	427,117	1,038,428	5,128,446	350,398	117,936	76,822	414,041	7,711,296
2010	91,155	118,248	848,050	4,815,408	443,870	35,381	58,391	168,248	6,578,751
2011	49,563	144,717	448,850	3,418,225	289,677	263,065	48,864	348,014	5,010,975

Table 5. Recreational releases (number) of Atlantic croaker by state, 1981-2011

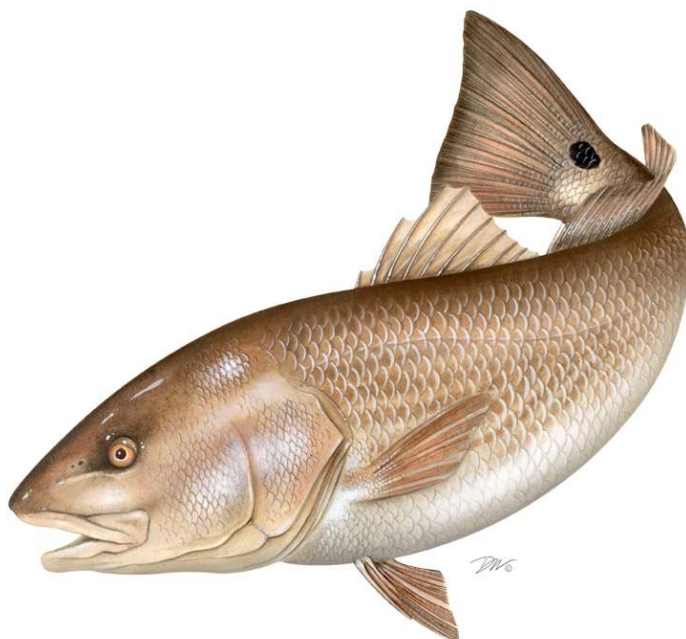
(Source: personal communication with NMFS Fisheries Statistics Division, Silver Spring, MD.)

Year	NJ	DE	MD	VA	NC	SC	GA	FL	Total
1981			16,233	324,238	704,259	128,192	13,481	85,740	1,272,143
1982				77,756	641,327	107,340	111,630	188,277	1,126,330
1983			1,507,184	1,410,151	424,562	119,036	70,499	379,021	3,910,453
1984			70,192	673,080	1,701,418	746,905	37,573	236,432	3,465,600
1985			13,132	1,616,052	1,596,901	238,678	66,649	1,146,582	4,677,994
1986		1,757	43,399	2,578,268	137,841	84,335	40,623	318,511	3,204,734
1987	1,374	861	32,074	2,056,580	560,853	108,366	76,908	1,770,697	4,607,713
1988		582	273,231	832,284	984,219	112,271	20,021	200,630	2,423,238
1989		1,307	41,822	1,342,169	891,926	58,642	17,632	72,822	2,426,320
1990		1,268	88,688	3,922,564	1,351,152	111,085	317,497	168,144	5,960,398
1991	91,633	75,319	3,352,190	7,418,045	669,385	25,168	140,402	647,824	12,419,966
1992	4,103	43,583	856,292	4,167,137	954,494	26,729	178,267	251,343	6,481,948
1993	5,799	13,194	2,504,362	5,795,479	1,499,217	16,949	83,203	138,875	10,057,078
1994	17,253	14,069	1,628,824	7,676,780	3,110,528	141,513	99,026	331,736	13,019,729
1995	31,019	41,574	496,046	5,494,289	1,172,716	108,345	89,609	141,732	7,575,330
1996	17,585	76,851	403,776	5,151,206	1,218,799	64,494	60,282	126,300	7,119,293
1997	111,468	384,233	1,497,670	7,275,160	1,443,568	138,107	25,630	116,276	10,992,112
1998	221,324	839,932	3,021,780	4,990,541	1,060,928	266,068	159,928	152,744	10,713,245
1999	860,325	1,017,499	2,483,800	5,668,925	1,368,478	116,826	57,567	967,894	12,541,314
2000	688,746	694,813	4,967,856	7,811,048	1,569,385	96,402	169,903	428,131	16,426,284
2001	853,621	285,123	1,585,806	7,086,706	1,256,807	115,284	192,362	282,461	11,658,170
2002	369,003	361,355	2,523,276	7,107,656	925,806	92,498	194,474	217,054	11,791,122
2003	833,508	654,697	1,393,224	6,543,524	1,552,315	440,446	965,496	192,356	12,575,566
2004	834,774	483,358	819,473	5,790,892	1,346,147	446,843	164,791	239,198	10,125,476
2005	1,280,075	761,136	950,695	8,144,430	1,289,279	327,215	265,542	271,001	13,289,373
2006	634,663	1,033,973	1,791,610	4,598,534	2,288,461	643,834	310,877	196,377	11,498,329
2007	572,164	617,811	1,630,587	9,510,502	1,538,050	336,816	221,902	443,928	14,871,760
2008	1,809,786	609,057	2,068,910	7,034,592	1,386,713	191,941	336,635	457,469	13,895,103
2009	146,160	516,499	779,805	6,859,844	1,685,893	484,116	473,973	469,230	11,415,520
2010	190,087	181,713	924,851	4,552,860	1,762,893	149,370	258,020	299,348	8,319,142
2011	114,468	145,283	268,359	4,791,121	1,747,038	269,517	287,614	398,352	8,021,752

**2012 REVIEW OF THE
ATLANTIC STATES MARINE FISHERIES COMMISSION
FISHERY MANAGEMENT PLAN FOR**

**RED DRUM
(*Sciaenops ocellatus*)**

2011 FISHING YEAR



The Red Drum Plan Review Team

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For Board Review

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I. Status of the Fishery Management Plan

<u>Date of FMP Approval:</u>	Original FMP – October 1984
<u>Amendments:</u>	Amendment 1 – October 1991 Amendment 2 – June 2002
<u>Management Areas:</u>	The Atlantic coast distribution of the resource from New Jersey through Florida Northern: New Jersey through North Carolina Southern: South Carolina through the east coast of Florida
<u>Active Boards/Committees:</u>	South Atlantic State/Federal Fisheries Management Board; Red Drum Technical Committee, Stock Assessment Subcommittee, Plan Development Team, Plan Review Team, Stock Enhancement Subcommittee; South Atlantic Species Advisory Panel

The Atlantic States Marine Fisheries Commission (ASMFC) adopted an interstate Fishery Management Plan (FMP) for Red Drum in 1984. The original management unit included the states from Florida to Maryland. In 1988, the Interstate Fisheries Management Program (ISFMP) Policy Board requested that all states from Florida to Maine implement the plan's recommended management regulations to prevent development of northern markets for southern fish. All Atlantic coastal states Florida through New Jersey are now required to implement the provisions of the FMP, while New York through Maine (including Pennsylvania) are encouraged to implement consistent provisions to protect the red drum spawning stock.

In 1990, the South Atlantic Fishery Management Council (Council) adopted an FMP for red drum that defined overfishing and optimum yield (OY) consistent with the Magnuson Fishery Conservation and Management Act of 1976. Adoption of this plan prohibited the harvest of red drum in the exclusive economic zone (EEZ), a moratorium that remains in effect today. Recognizing that all harvest would take place in state waters, the Council FMP recommended that states implement measures necessary to provide the target level of at least 30% escapement.

Consequently, the ASMFC updated the interstate FMP in 1991 with Amendment 1, which included the goal to attain optimum yield from the fishery over time. Optimum yield was defined as the amount of harvest that could be taken while maintaining the spawning stock biomass per recruit (SSBR) level at or above 30% of the level that would result if fishing mortality were zero. However, the lack of adequate information on the status of the adult stock resulted in the use of a 30% escapement rate of sub-adult red drum to the off-shore adult spawning stock.

Substantial reductions in fishing mortality were necessary to achieve the escapement rate; however, because of a lack of data on the status of adult red drum along the Atlantic coast, a phase-in approach with a 10% SSBR goal was adopted. States were recommended to implement or maintain harvest controls necessary to attain the goal. All states in the management unit north of Florida modified regulations and/or commercial quotas to reach this goal. Florida maintained its strict regulations that were thought to exceed the target escapement rate. The harvest regulations remained unchanged from 1992-1998, except in Florida where regulations were relaxed somewhat by opening the previously closed March-May period.

As hoped, these management measures led to increased escapement rates of juvenile red drum. Escapement estimates for a northern region from New Jersey through North Carolina (18%) and a southern region from South Carolina through the east coast of Florida (17%) were estimated to be above the 10% phase-in goal, yet still below the ultimate goal of 30% (Vaughan and Carmichael 2000). These regions were based on stock identity, mark-recapture experiments, life history, habitat preferences, human dimensions of the fisheries, and management goals. North Carolina, South Carolina, and Georgia implemented substantive changes to their regulations from 1998-2001 that further restricted the harvest of red drum.

The Council adopted new definitions of OY and overfishing for red drum in 1998. Optimum yield was redefined as the harvest associated with a 40% static spawning potential ratio (sSPR), overfishing as an sSPR less than 30%, and threshold overfishing as 10% sSPR. A year later, the Council also recommended that management authority for red drum be transferred to the states through the Commission's Interstate Fishery Management Program (ISFMP) process. One reason the Council recommended this transfer to the ASMFC was the inability to accurately determine an overfished status and therefore stock rebuilding targets and schedules as required under the revised Sustainable Fisheries Act of 1996. The management transfer would necessitate the development of an amendment to the interstate FMP, in order to include the provisions of the Atlantic Coastal Fisheries Cooperative Management Act.

The ASFMC adopted Amendment 2 to the Red Drum FMP in June 2002 (ASMFC 2002), which serves as the current management plan. The goal of Amendment 2 is to achieve and maintain the OY for the Atlantic coast red drum fishery as the amount of harvest that can be taken by U.S. fishermen while maintaining the sSPR at or above 40%. There are four plan objectives:

- Achieve and maintain an escapement rate sufficient to prevent recruitment failure and achieve an sSPR at or above 40%.
- Provide a flexible management system to address incompatibility and inconsistency among state and federal regulations which minimizes regulatory delay while retaining substantial ASMFC, Council, and public input into management decisions; and which can adapt to changes in resource abundance, new scientific information, and changes in fishing patterns among user groups or by area.
- Promote cooperative collection of biological, economic, and sociological data required to effectively monitor and assess the status of the red drum resource and evaluate management efforts.
- To restore the age and size structure of the Atlantic coast red drum population.

The management area extends from New Jersey through the east coast of Florida, and is separated into a northern and southern region with the division occurring at the North Carolina/South Carolina border. The sSPR of 40% is considered a target; an sSPR below 30% (threshold level) results in an overfishing determination for red drum.

All states in the management area were required (rather than recommended as in previous versions of the plan) to implement appropriate recreational bag and size limit combinations needed to attain the target sSPR. Amendment 2 also required all states to maintain their current,

or implement more restrictive, commercial fishery regulations. The states implemented the provisions of Amendment 2 by January 1, 2003. See Table 1 for state commercial and recreational regulations in 2011.

Following the approval of Amendment 2 in 2002, the process was begun to transfer management authority, including an Environmental Assessment and public comment period. The final rule for the transfer of management authority became effective November 5, 2008. It repeals the federal Atlantic Coast Red Drum Fishery Management Plan and transfers the management authority of Atlantic red drum in the exclusive economic zone from the South Atlantic Fishery Management Council, in cooperation with the Mid-Atlantic Fishery Management Council, under the Magnuson-Stevens Conservation and Management Act to the Atlantic States Marine Fisheries Commission under the Atlantic Coastal Fisheries Cooperative Management Act, as requested by the Councils and the Commission.

II. Status of the Stocks

At present, only overfishing status can be determined for red drum (SAFMC 2009). The threshold (below which the stock is experiencing overfishing) and the target fishing mortality rates are those that achieve 30 % and 40 % sSPR, respectively. The three-year average sSPR is compared to these reference points. The stock is assessed by region. The next benchmark assessment is scheduled for 2015,

Northern Region

Recruitment (age 1 abundance) has fluctuated widely and without apparent trend since 1989 (Figure 1). Abundance of age 1 – 3 red drum increased during 1990 – 2000 after which it fluctuated widely (Figure 2). The initial increase in abundance of these age groups can be explained by the reduction in exploitation rates in the early part of the time series with relative stability since then (Figure 3).

The trend in the three-year average sSPR indicates low sSPR at the start of the time series with increases during 1990 – 1997 and fluctuations thereafter (Figure 4). The average sSPR has been above the overfishing threshold ($F_{30\%}$) since 1994, and with the exception of one year (2002) has been at or above the target ($F_{40\%}$) since 1996. Fishing pressure and mortality appear to be stable and holding near the target fishing mortality. There is a high probability that the stock is not subject to overfishing. The average sSPR is also likely above the target benchmark. Fishing mortality could be allowed to increase relative to the overfishing threshold, but the level of risk associated with any increase should be considered and reviewed in conjunction with Addendum II's goal of maintaining a 40% SPR.

Southern Region

The relative trend in recruitment (age 1 abundance) has fluctuated without apparent trend since 1989 (Figure 1). The relative trend in abundance of age 1 – 3 red drum increased during 1989 – 1992, declined during 1992 – 1998 and has fluctuated thereafter (Figure 2). As with the northern stock, the initial increase in abundance of these age groups can be explained by the reduction in exploitation rates in the early part of the time series. There appears to have been a slight increase

in exploitation rates since 1990 (Figure 3). This is reflected in the long-term decline in the relative trend of the three-year average sSPR since 1990 (Figure 4).

There is a high level of uncertainty around the sSPR estimates for the southern region. More work is needed to make definitive statements about sSPR, but it is likely that the average sSPR in 2007 was above the overfishing threshold ($F_{30\%}$), although not above the target as likely in the northern region. The stock is therefore likely not subject to overfishing at this time. Due to the uncertainties, it is not possible to determine status in relation to the target of 40% sSPR.

III. Status of the Fishery

Total red drum landings from New Jersey through the east coast of Florida in 2011 are estimated at 1.6 million pounds (Tables 2 and 3, Figure 5). This represents a 25% decrease from the total harvest in 2010 and is just below (6%) the previous ten-year (2001-2010) average. The commercial and recreational fisheries harvested 6 and 94% of the total, respectively. In 2011, 99% of the total landings came from the South Atlantic region, where the fishery is almost exclusively recreational, and less than 1% from the Mid-Atlantic region, which did not record any recreational landings through the Marine Recreational Fisheries Statistical Survey (Figure 6).

Few commercial landings of red drum have been recorded in states north of Maryland (Table 2). Coastwide commercial landings show no particular temporal trends, ranging from approximately 55,000 to 440,000 pounds annually over the last 50 years (Figure 5). The greatest harvest was taken in 1980, and the lowest in 2004. In 2011, coastwide commercial harvest decreased from 235,174 pounds in 2010 to 96,578 pounds, the majority (95%) from North Carolina (Table 2). Historically, the major commercial harvesters were North Carolina and Florida. However, commercial harvest has been prohibited in Florida under state regulation since January 1988. South Carolina also banned the commercial harvest or sale of native caught red drum beginning in 1987.

In North Carolina, a daily commercial trip limit and an annual cap of 250,000 pounds, with payback of any overage, constrain the commercial harvest. The red drum fishing year in North Carolina extends from September 1 to August 31 (all other states operate on a calendar year). In 2008, the Management Board approved using the fishing year to monitor the cap. During the 2009/2010 fishing year, North Carolina had an overage of 25,858 lbs and set its 2010/2011 fishing cap at 224,142 lbs. North Carolina's harvest for 2010/2011 was 126,185 pounds (2011 calendar harvest was 91,951 pounds), which corrected the overage.

Recreational harvest of red drum peaked in 1984 at 1.05 million fish (or 2.6 million pounds; Tables 3 and 4). Since 1988, the number has fluctuated without trend between 250,000 and 530,000 fish (800,000 to 1.7 million pounds; Figures 5 and 7). Recreational harvest decreased from 728,509 fish (1.9 million pounds) in 2010 to 471,959 fish (1.5 million pounds) in 2011, which is near the 2009 harvest level of 400,340 fish (1.3 million pounds). The 2011 harvest represents a 2% increase in numbers although a 3% decrease in pounds from the previous ten year (2001-2010) average. Florida anglers landed the largest share of the coastwide recreational harvest in numbers (34%), followed by South Carolina (31%), Georgia (26%), and North Carolina (9%). Anglers release far more of the red drum they catch than they keep; the percent of

the catch released is generally over 80% during the last decade (Figure 7). Recreational releases show an increasing trend over the time series. The proportion of releases remained steady in 2011 at 80% (versus 85% in 2009), although the overall number of fish released decreased by approximately 1 million to 1.9 million fish (Figure 3, Table 5). It is estimated that 8% of released fish die as a result of being caught, resulting in an estimated 155,295 dead discarded fish in 2011 (Table 5). Recreational removals from the fishery are thus estimated to be 627,254 fish in 2011 (Figure 8).

IV. Status of Assessment Advice

Current stock status information comes from the 2009 benchmark stock assessment (SAFMC 2009) completed by the ASMFC Red Drum Stock Assessment Subcommittee and Technical Committee, peer reviewed by an independent panel of experts at the Southeast Data, Assessment, and Review (SEDAR) 18, and approved by the South Atlantic State-Federal Fisheries Management Board for use in management decisions. Previous interstate management decisions were based on regional assessments conducted by Vaughan and Helser (1990), Vaughan (1992, 1993, 1996), and Vaughan and Carmichael (2000). Several states have also conducted state-specific assessments (e.g., Murphy and Munyandorero 2009; Takade and Paramore 2007).

The 2009 stock assessment uses a statistical catch at age (SCA) model with age-specific data for red drum ages 1 through 7+. The Stock Assessment Subcommittee decided to move away from virtual population analyses used in past assessments primarily because of the assumption inherent in these models that the catch at age is known without error, whereas there is limited data to describe the catch of red drum early in the time series. Data available for the years 1989 through 2007 were included from the following sources: commercial and recreational harvest and discard data, fishery-dependent and -independent biological sampling data, tagging data, and fishery-independent survey abundance data.

The SEDAR 18 Review Panel considered the use of an SCA model appropriate given the types of data available for red drum. With certain revisions made to the data and the model configurations before or at the Review Workshop, the SEDAR 18 Review Panel supported the use of the final model runs. For the northern region, the Review Panel agreed that the model was informative of age 1 – 3 abundance and exploitation rates, but not for older age groups. The model was also found to be informative of annual trends in static spawning potential ratio (sSPR) and the 2005 – 2007 average sSPR. For the southern region, the Review Panel agreed that the model was informative of relative (not absolute) trends in age 1 – 3 abundance and exploitation, but not for older age groups. The model was also considered to be informative of relative trends in annual sSPR and the three-year average sSPR, this result being highly conditional on the estimated fishery selectivity pattern. These results for the southern region allow for only general statements on stock status.

The Review Panel accepted the existing threshold and target overfishing benchmarks of 30% sSPR and 40% sSPR for red drum. However, the Review Panel did not consider annual changes in sSPR to be informative and recommended adopting a three-year running mean of estimated annual sSPR as the indicator to compare to the management benchmarks. Because of the high uncertainty in the age 4 – 7+ dynamics, the Review Panel did not see value in attempting to

estimate indicators and benchmarks of stock biomass which would be used to measure overfished status.

The next benchmark stock assessment is scheduled for 2015.

V. Status of Research and Monitoring

There are no monitoring or research programs required annually of the states except for the submission of a compliance report. The following fishery-dependent (other than catch and effort data) and fishery-independent monitoring programs were reported in the 2012 reports.

Fishery Dependent Monitoring

- Maryland DNR – Samples commercial pound nets once every other week in the Chesapeake Bay from late spring through summer (2011: 2 fish). Dealer sampling of red drum initiated in 2009 (2011: 0 fish). Monitors the number of sportfishing citations issued for large red drum releases (2011: 1 entry). Monitors licensed charter boat captain logbooks for red drum captures (2011: 12 caught, 5 harvested).
- Virginia MRC – Samples commercially landed red drum through its biological monitoring program (2011: 7 fish). Coordinates volunteer angler tagging of red drum via the Virginia Game Fish Tagging Program that began in 1995 (2011: 1,219 fish tagged, 282 reported recaptures). Collects carcasses through the Marine Sportfish Collection Project (2011: 0 fish).
- North Carolina DMF – Samples commercially-landed red drum through its biological monitoring program (2011: 647 fish, primarily gill net).
- South Carolina DNR – Conducts a state finfish survey for catch, effort, and length data (2011: parties with targeted trips = 519, catch n = 1,706). Monitors charterboat trip reports for catch and effort data (2011: release rate = 92.3%). Runs a cooperative public tagging program to study movement patterns, growth rates, and release-mortality rates (2011: 368 fish tagged, 56 recaptured). Collects data from fishing tournaments and a carcass collection program (2010: 119 fish). Georgia CRD – Collects age, length, and gender data through the Marine Sportfish Carcass Recovery Project (2011: 551 red drum).
- Florida FWC – Conducts a random survey of licensed anglers on the sizes of kept and released fish (2002-2009: 101 lengths collected from 139 trips).
- NMFS – Collects recreational catch, harvest, release, and effort data, and length measurements via the Marine Recreational Fisheries Statistics Survey.

Fishery Independent Monitoring

- North Carolina DMF - Conducts a seine survey to produce an age-0 abundance index (2011: n=1,260; CPUE continued to increase over 2-fold to 10.9 and higher than long-term mean). Conducts a gill net survey in Pamlico Sound to characterize size and age distribution, produce an abundance index, improve bycatch estimates, and study habitat usage (2011: n= 100; CPUE continued to decrease to 0.43, the lowest value in the past decade); DMF conducts a longline survey to produce an adult index of abundance and tag fish (2011: n=406; CPUE: slight increase to 5.64 fish per set).
- South Carolina DNR – Conducts an estuarine trammel net survey for subadults (CPUE: slight increase since 2007, although decreased from 2010). Conducts an electrofishing survey in low salinity estuarine areas for juveniles and sub-adults (CPUE: general increase

since 2007). Conducts an inshore bottom longline survey for biological data and an abundance index of adults (2011 mix of increases and decreases in CPUE). Tags fish caught in each of these surveys (45,056 fish from trammel nets since 1991 (2011 n = 2,094); 5,844 fish from electrofishing since 2001 (2011 n = 594); 3,746 fish from longline since 1994 (2011 n = 329)).

- Georgia CRD – Conducts an estuarine trammel net survey for subadult biological data and an abundance index (2011: n = 150; CPUE decreased in Wassaw estuary to 0.08 from 1.18 and in the Altamaha river delta from 2.08 to 0.38). Conducts an estuarine gill net survey for young-of-year biological data and an abundance index (2011: n = 216; CPUE decreased in Wassaw estuary to 1.32 from 4.32 and in the Altamaha river delta from 3.17 to 1.08). Conducts a survey to determine the age structure of the adult stock on five year intervals (next sampling in 2012). Conducts a bottom longline survey for adult biological data and an abundance index (2011: n = 87; CPUE stayed level at 0.31 fish per set).
- Florida FWC-FWRI – Conducts two seine surveys in the northern Indian River Lagoon (IRL) and the lower reaches of the St. Johns River (SJR) for young-of-the-year (< 40 mm SL) abundance indices (CPUE: decrease in 2010 in IRL; relatively constant since 2007 although large decrease in 2010 in SJR). FWC-FWRI conducts a haul seine survey in these areas and the southern IRL for a subadult index (CPUE: increasing trend since 2004 in the northern and southern IRL before dropping to lower levels in 2009 and 2010; fluctuating with an increasing trend since 2004 in SJR). Age and length data are collected during surveys (2011: 747 lengths from 183 meter haul seines, 117 otoliths from sampled fish).

Ageing Workshop

A Red Drum Ageing Workshop was held in October 2008. The Red Drum Technical Committee indicated the need for such as workshop prior to the 2009 stock assessment to standardize the otolith sectioning and ageing procedures and the current age dataset. Representatives from Virginia, North Carolina, South Carolina, Georgia, Florida, the National Marine Fisheries Service, and the Gulf Council participated in the workshop. In addition to improving the age dataset for the ongoing assessment, the resulting standardized ageing procedure was published in an ASMFC reference document, with some states having already incorporated ageing instructions into their references..

VI. Status of Management Measures and Issues

Fishery Management Plan

Amendment 2 was fully implemented by January 1, 2003 and provided the management requirements for 2010. Requirements include: recreational regulations designed to achieve at least 40% sSPR; a maximum size limit of 27 inches or less; and current or more stringent commercial regulations. States are also required to have in place law enforcement capabilities adequate for successfully implementing their red drum regulations. No additional amendments or addenda are under development.

De Minimis Requests

New Jersey and Delaware requested *de minimis* status through the annual reporting process. While Amendment 2 does not include a specific method to determine whether a state qualifies for *de minimis*, the PRT chose to evaluate the two states' contribution to the fishery by

comparing each state's two-year average of combined commercial and recreational landings to that of the management unit. New Jersey and Delaware harvested each harvested zero percent of the two-year average total landings. *De minimis* status does not exempt either state from any requirement; it may exempt them from future management measures implemented through addenda to Amendment 2, as determined by the Management Board.

Changes to State Regulations

North Carolina's commercial season and trip limit were modified through the proclamation authority of the NCDMF Director in response to high landings during the 2009/2010 fishing year. The fishery was briefly closed April 13 to April 30, 2010, and the 2010/2011 cap was reduced to 224,142 to account for the 25,858 lb overage in 2009/2010.

There were no changes to state regulations in 2011.

For 2012, Florida increased its bag limit in the northern region from one to two fish per day.

VII. Implementation of FMP Compliance Requirements for 2011

The PRT finds that all states have implemented the requirements of Amendment 2.

VIII. Recommendations of the Plan Review Team

Management and Regulatory Recommendations

- < Consider approval of the *de minimis* requests by New Jersey and Delaware
- < Support a continued moratorium of red drum fishing in the exclusive economic zone.
- < Based on the stock status, relative to the target

Prioritized Research and Monitoring Recommendations (H) =High, (M) =Medium, (L) =Low

Stock Assessment and Population Dynamics

- < Improve catch/effort estimates and biological sampling from recreational and commercial fisheries for red drum, including increased effort to intercept night fisheries for red drum. This should include significant efforts to determine the size and age structure of regulatory discards of live red drum. (H)
- < States should maintain annual age-length keys. Expand biological sampling based on a statistical analysis to adequately characterize the age/size composition of removals by all statistical strata (gears, states, etc.) (H)
- < Each state should develop an on-going red drum tagging program that can be used to estimate both fishing and natural mortality and movements. This should include concurrent evaluations of tag retention, tagging mortality, and angler tag reporting rates. (M)
- < Establish programs to provide on-going estimates of commercial discards and recreational live release mortality using appropriate statistical methods. Discard estimates should examine the impact of slot-size limit management and explore regulatory discard impacts due to high-grading. (M)
- < Evaluate the broader survey needs to identify gaps in current activities and provide for potential expansion and/or standardization between/among current surveys (M).

Biological

- < Explore methods to effectively sample the adult population in estuarine, nearshore, and open ocean waters, such as in the ongoing red drum long line survey. (H)
- < Determine if natural environmental perturbations limit recruitment, and if spawning stock size is the cause of recruitment variability (H)
- < Continue tagging studies to determine stock identity, inshore/offshore migration patterns of all life stages (i.e. basic life history info gathering). Specific effort should be given to developing a large-scale program for tagging adult red drum (M)
- < Fully evaluate the effects and effectiveness of using cultured red drum to facilitate higher catch rates along the Atlantic coast. (M)
- < Determine habitat preferences, environmental conditions, growth rates, and food habits of larval and juvenile red drum throughout the species range along the Atlantic coast. Assess the effects of environmental factors on stock density/yearclass strength. (M)
- < Refine maturity schedules on a geographic basis. Thoroughly examine the influence of size and age on reproductive function. Investigate the possibility of senescence in female red drum. (M)

Social

- < Examine the effectiveness of controlling fishing mortality and minimum size in managing red drum fisheries.
- < Encourage the NMFS to fund socioeconomic add-on questions to the recreational fisheries survey that are specifically oriented to red drum recreational fishing.

Economic

- < Encourage the NMFS to continue funding socioeconomic add-on questions to the recreational fisheries survey that include data elements germane to red drum recreational fisheries management.
- < Where appropriate, encourage member states to conduct studies to evaluate the economic costs and benefits associated with current and future regulatory regimes impacting recreational anglers including anglers oriented toward catch and release fishing trips.
- < Fully evaluate the efficacy of using cultured red drum to restore native stocks along the Atlantic Coast including risk adjusted cost-benefit analyses.
- < Conduct a special survey and related data analysis to determine the economic and operational characteristics of the "for-hire sector" targeting red drum especially fishing guide oriented businesses in the South Atlantic states.
- < Estimate the economic impacts (e.g. sales, jobs, income, etc.) of recreational red drum fisheries at the state and regional level including the "for-hire sector" (e.g. fishing guides).
- < States with significant fisheries (over 5,000 pounds) should collect socioeconomic data on red drum fisheries through add-ons to the recreational fisheries survey or by other means.

Habitat

- < Identify spawning areas of red drum in each state from North Carolina to Florida so these areas may be protected from degradation and/or destruction. (H)
- < Identify changes in freshwater inflow on red drum nursery habitats. Quantify the relationship between freshwater inflows and red drum nursery/sub-adult habitats. (H)

- < Determine the impacts of dredging and beach re-nourishment on red drum spawning and early life history stages. (M)
- < Investigate the concept of estuarine reserves to increase the escapement rate of red drum along the Atlantic coast. (M)
- < Identify the effects of water quality degradation (changes in salinity, DO, turbidity, etc.) on the survival of red drum eggs, larvae, post-larvae, and juveniles. (M)
- < Quantify relationships between red drum production and habitat. (L)
- < Determine methods for restoring red drum habitat and/or improving existing environmental conditions that adversely affect red drum production. (L)

IX. References

- Atlantic States Marine Fisheries Commission (ASMFC). 2002. Amendment 2 to the Interstate Fishery Management Plan for Red Drum. ASMFC, Washington, DC, Fishery Management Report No. 38, 141 p.
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- South Atlantic Fishery management Council (SAFMC). 2009. Southeast Data, Assessment and Review 18, Stock Assessment Report, Atlantic Red Drum. North Charleston, SC. 544 p.
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- Vaughan, DS and TE Helsler. 1990. Status of the red drum stock of the Atlantic coast: Stock assessment report for 1989. NOAA Tech. Mem. NMFS-SEFC-263. 117 p.

X. Figures

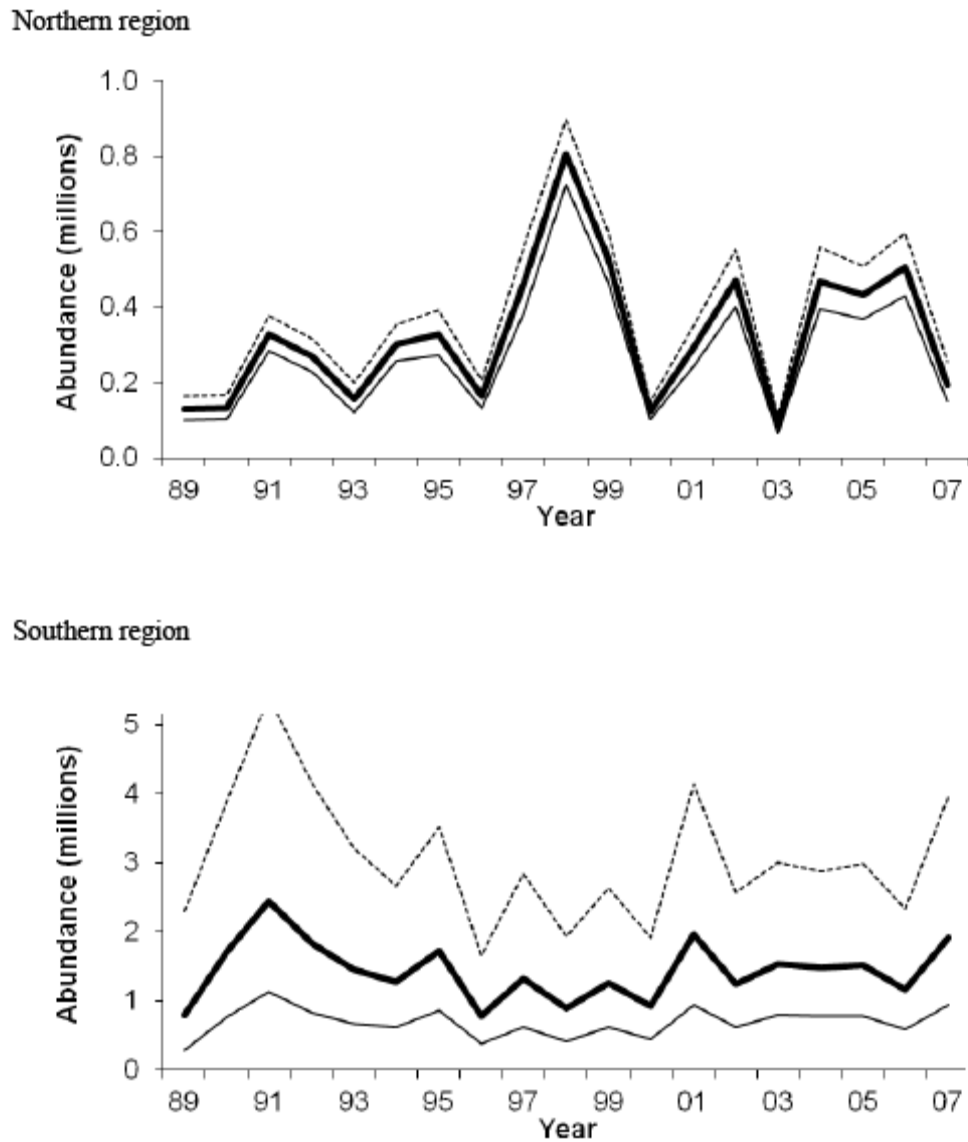
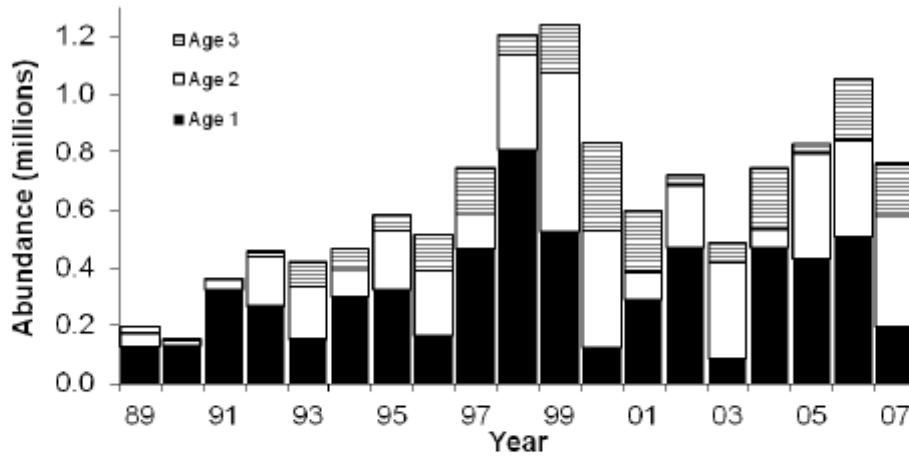


Figure 1. Estimated recruitment (age-1 abundance, heavy solid line) and ± 1.96 standard errors for the northern and southern regions during 1989-2007 (Source: SAFMC 2009). Note: assessment results for the southern region are indicative of relative trends but not absolute values.

Northern region



Southern region

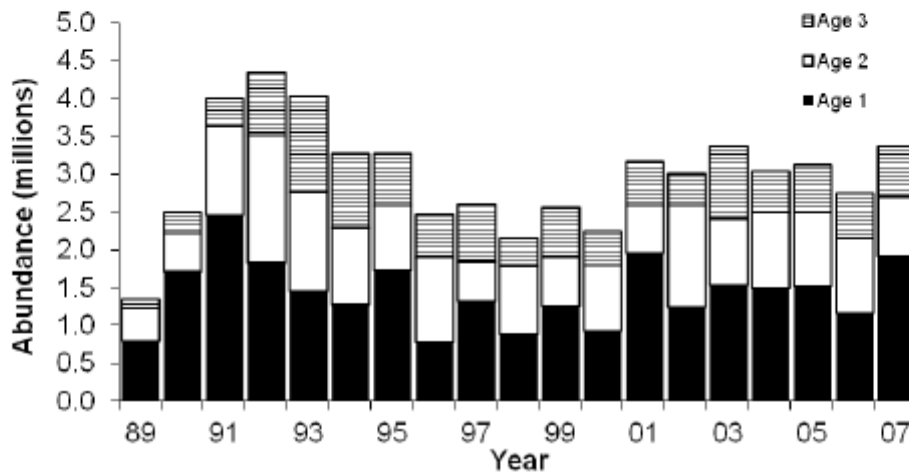


Figure 2. Estimates of abundance of red drum ages 1-3 in the northern and southern regions during 1989-2007 (Source: SAFMC 2009). Note: assessment results for the southern region are indicative of relative trends but not absolute values.

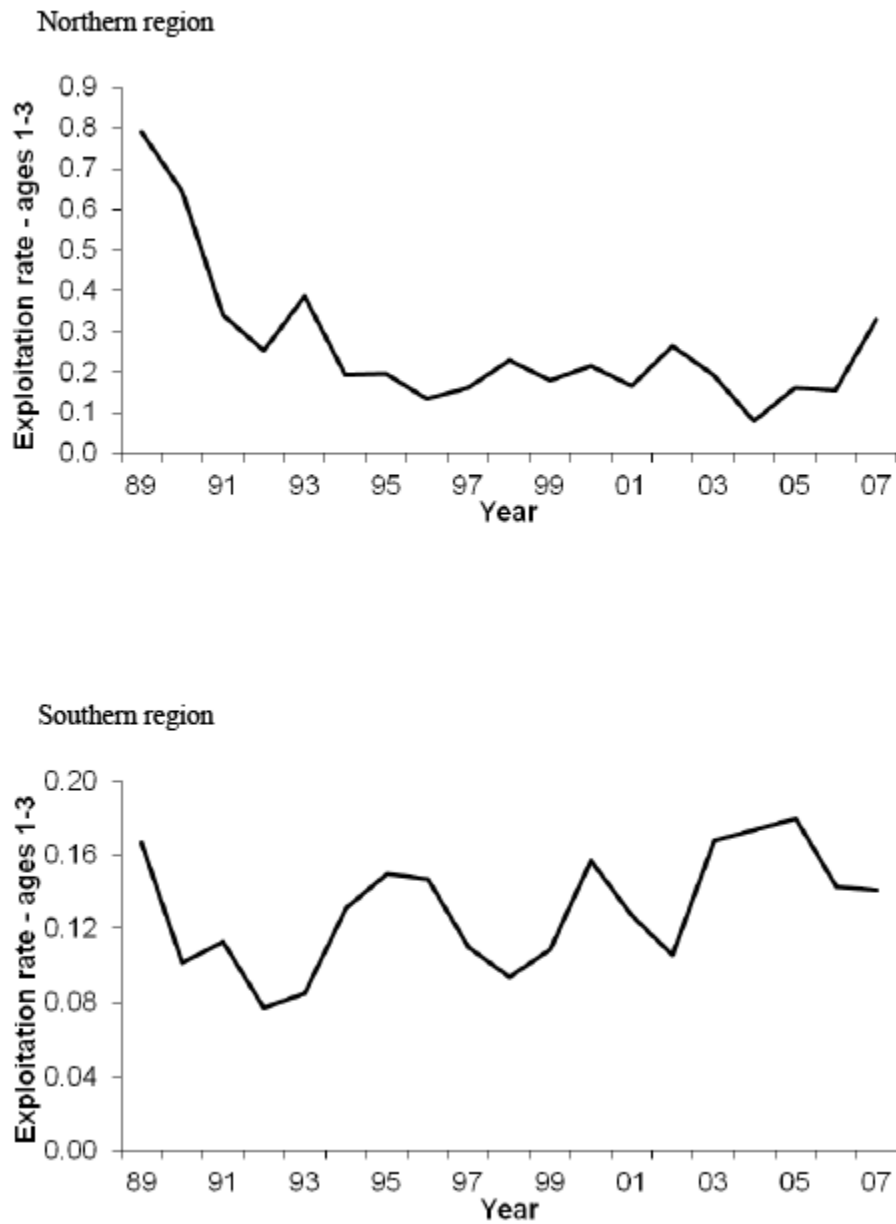
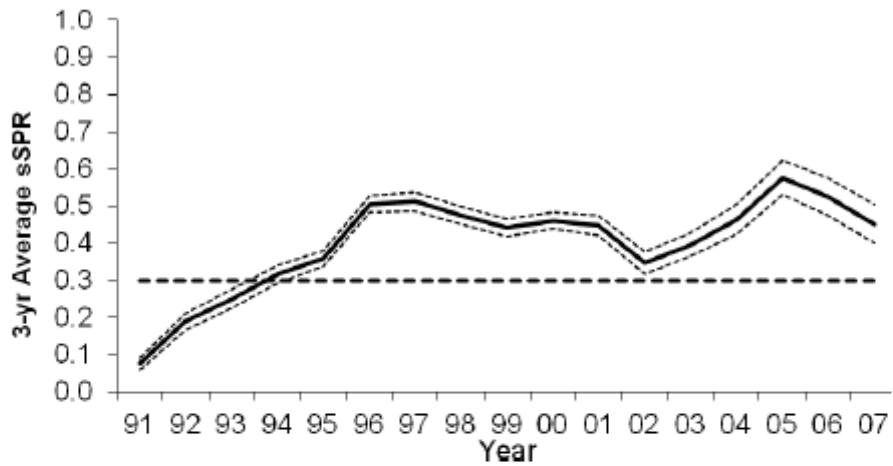


Figure 3. Estimated annual exploitation rate for red drum ages 1-3 in the northern and southern regions during 1989-2007 (Source: SAFMC 2009). Note: assessment results for the southern region are indicative of relative trends but not absolute values.

Northern region



Southern region

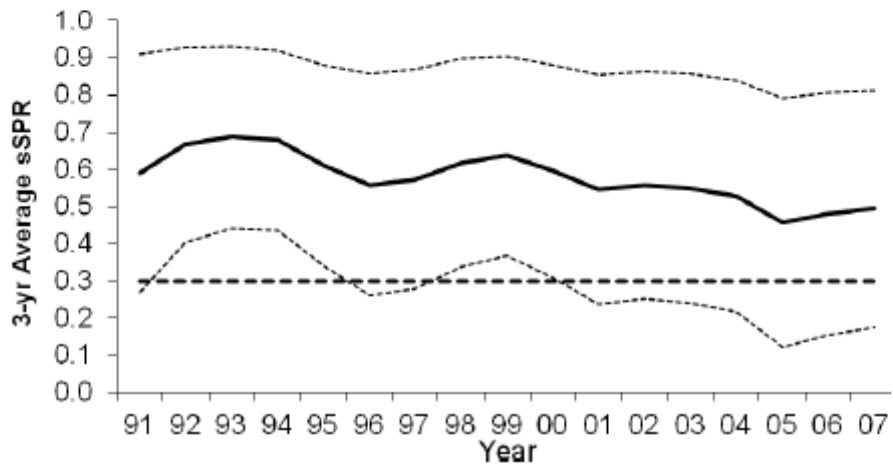


Figure 4. Northern and southern region estimates of three-year average static spawning potential ratio with ± 1.96 standard errors (dashed lines) during 1991-2007. Three-year averages include current and previous two year's sSPR estimates. The heavy dashed line shows the 30% overfishing threshold (Source: SAFMC 2009). Note: assessment results for the southern region are indicative of relative trends but not absolute values.

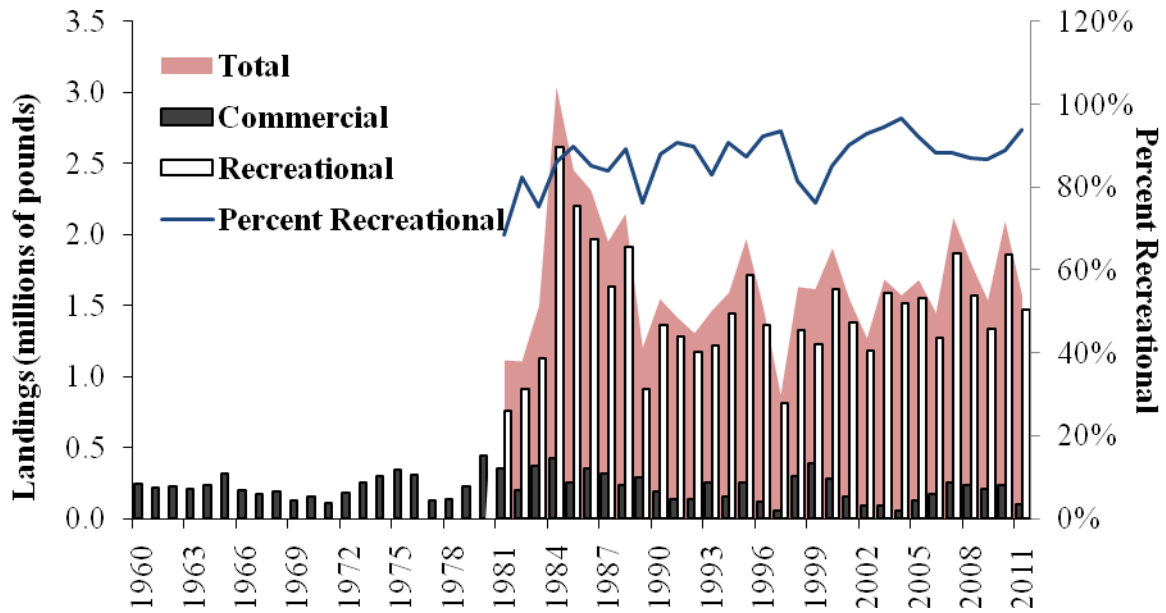


Figure 5. Commercial and recreational landings (pounds) of red drum. Recreational data not available prior to 1981. See Tables 2 and 3 for values and data sources.

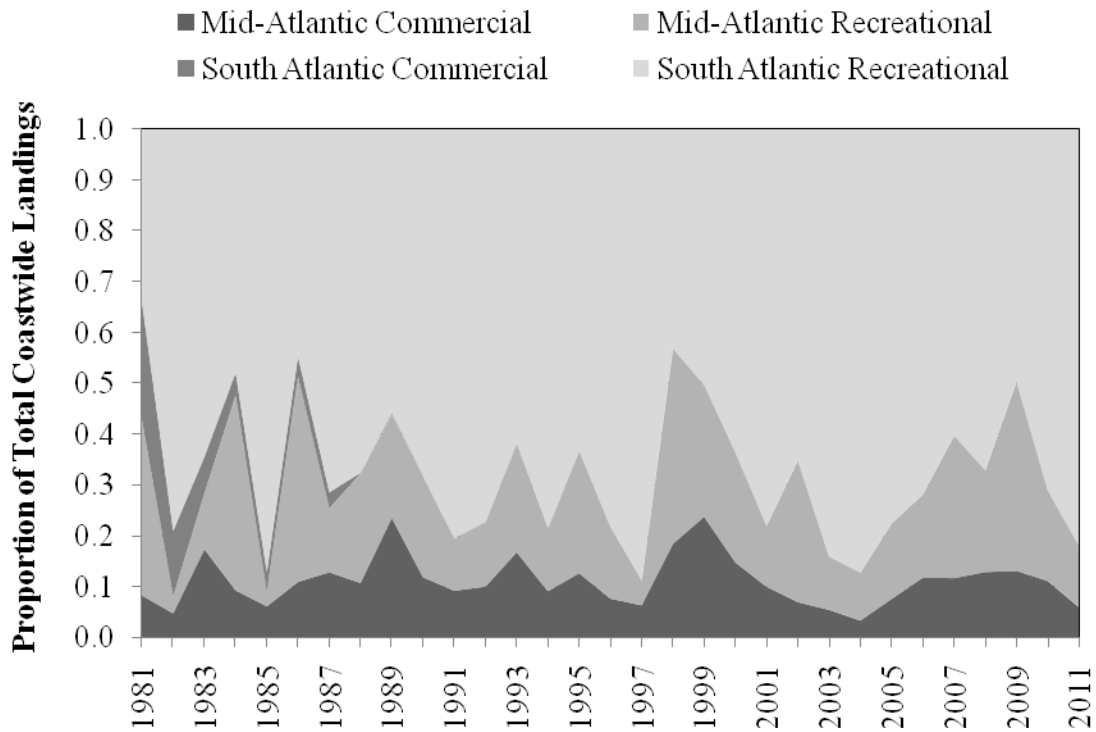


Figure 6. Proportion of regional, sector-specific landings to total coastwide landings (pounds). See Tables 2 and 3 for data sources.

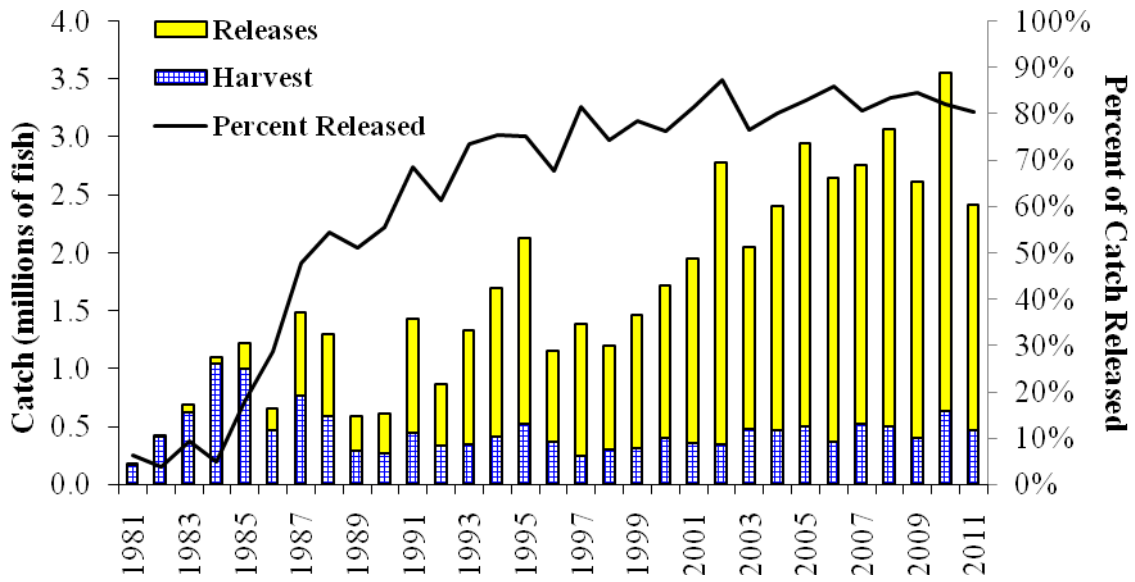


Figure 7. Recreational catch (harvest and alive releases) of red drum (numbers) and the proportion of catch that is released. See Tables 4 and 5 for values and data sources.

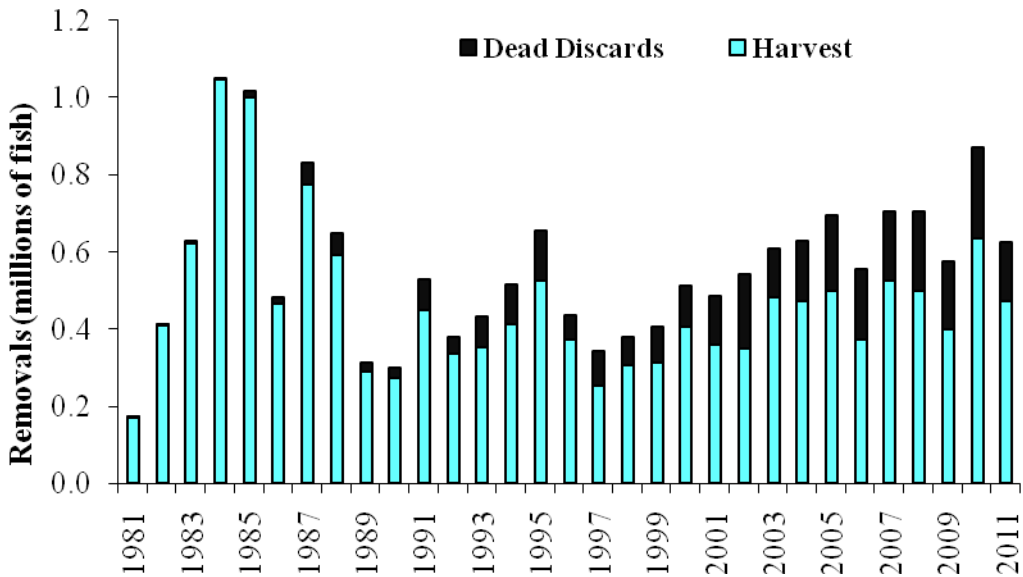


Figure 8. Recreational removals (harvest and dead discards) of red drum (numbers). Dead discards are estimated by applying an 8% discard mortality rate to alive releases. See Tables 4 & 5 for values and data sources.

XI. Tables

Table 1. Red drum regulations for 2011. The states of New Jersey through Florida are required to meet the requirements in the FMP; states north of New Jersey are encouraged to follow the regulations. All size limits are total length.

State	Recreational	Commercial
ME	None	None
NH	14" - 27", 5 fish	14" - 27", 5 fish
MA	14" min	14" min
RI	None	None
CT	≤ 27"	≤ 27"
NY	≤ 27"	≤ 27"
PA	None	None
NJ	18" - 27", 1 fish	18" - 27", 1 fish
DE	20" - 27", 5 fish	20" - 27", 5 fish
MD	18" - 27", 1 fish	18" - 25", 5 fish
PRFC	18" - 25", 5 fish	18" - 25", 5 fish
VA	18" - 26", 3 fish	18" - 26", 3 fish
NC	18" - 27", 1 fish	18" - 27"; 250,000 lb harvest cap with overage payback; 4 and 7 fish daily trip limits during the year (1 fish for hook and line); closed December 1, 2008 – April 31, 2009; red drum must be less than 50% of catch (lbs, excluding menhaden); small mesh (<5" stretched mesh) gill nets attendance requirement May 1 - November 30. Fishing year: September 1 – August 31. Quota reduced to 235,174 pounds for 2010/11 fishing year to account for overage
SC	15" - 23", 3 fish. Gigging allowed November - March.	Gamefish Only
GA	14" - 23", 5 fish	14" - 23", 5 fish
FL	18" - 27", 1 fish	Sale of native fish prohibited

Table 2. Commercial landings (pounds) of red drum by state, 1981-2011. (Source: personal communication with NMFS Fisheries Statistics Division, Silver Spring, MD and ACCSP, Arlington, VA, except where noted below)

Year	NJ	DE	MD	PRFC	VA	NC	SC	GA	FL	Total
1981					200	93,420		261	258,374	352,255
1982					1,700	52,561	2,228	251	139,170	195,910
1983			100		41,700	219,871	2,274	1,126	105,164	370,235
1984					2,600	283,020	3,950	1,961	130,885	422,416
1985					1,100	152,676	3,512	3,541	88,929	249,758
1986			1,000		5,400	249,076	12,429	2,939	77,070	347,914
1987					2,600	249,657	14,689	4,565	42,993	314,504
1988			8,100	2	4,000	220,271		3,281	284	235,938
1989			1,000	86	8,200	274,356	165	3,963		287,770
1990			29	86	1,481	183,216		2,763		187,575
1991			7,533	3,808	24,771	96,045		1,637		133,794
1992			1,087	196	2,352	128,497		1,759		133,891
1993			55		8,637	238,099		2,533		249,324
1994			859		4,080	142,119		2,141		149,199
1995			6		2,992	248,122		2,578		253,698
1996			215		2,006	113,338		2,271		117,830
1997			22	4	3,820	52,502		1,395		57,743
1998	311		336		6,456	294,366		672		302,141
1999	241	6	504	186	10,856	372,942		1,115		385,850
2000			843	10	11,512	270,953		707		284,025
2001			727	191	4,905	149,616		*		155,439
2002			1,161	310	7,361	81,370		*		90,202
2003			631	47	2,716	90,525		*		93,919
2004	12		12		638	54,086		*		54,748
2005			37	51	527	128,770		*		129,385
2006			8	2	2,607	169,206		*		171,823
2007			90	58	6,372	243,227		*		249,747
2008			40	69	4,585	229,809		*		234,503
2009	129		12	157	8,314	194,296		*		201,908
2010			19	22	3,373	231,760		*		235,174
2011				3	4,204	91,951				96,578

* Notes: NJ landings from SAFIS, 2004-present; MD landings from state reporting program, 1991-present; PRFC landings from agency reporting program, 1988-present; VA landings from state reporting program, 1996-present; NC landings from state reporting program, 1994-present; GA landings from state reporting program, 2000-present, * indicates confidential landings because less than three dealers reported.

Table 3. Recreational landings (pounds) of red drum by state, 1981-2011. (Source: personal communication with NMFS Fisheries Statistics Division, Silver Spring, MD)

Year	NJ	DE	MD	VA	NC	SC	GA	FL	Total
1981			4,370	347,939	31,519	50,230	9,442	317,963	761,463
1982					37,511	340,686	52,150	480,676	911,023
1983			3,018	51,299	109,540	222,691	67,298	675,924	1,129,770
1984				1,285	1,160,539	183,282	294,583	976,971	2,616,660
1985					70,677	1,532,316	185,887	414,176	2,203,056
1986			754,161	145,517	31,594	498,586	173,837	360,725	1,964,420
1987				44,332	200,729	913,639	250,795	227,222	1,636,717
1988				9,030	451,974	1,050,049	385,860	12,507	1,909,420
1989			2,348	27,236	214,849	396,771	127,245	146,064	914,513
1990			2,679		302,994	631,819	161,712	258,569	1,357,773
1991			5,635	30,582	108,268	284,290	337,207	516,999	1,282,981
1992				55,324	109,134	411,484	198,751	396,555	1,171,248
1993				45,505	266,459	282,614	328,245	290,930	1,213,753
1994				3,684	192,060	314,632	353,616	578,412	1,442,404
1995				66,270	405,620	417,595	300,337	525,231	1,715,053
1996				1,512	204,556	396,394	164,756	596,483	1,363,701
1997				1,810	39,077	296,155	129,836	345,390	812,268
1998				34,861	591,428	129,619	84,348	487,091	1,327,347
1999				92,794	326,303	103,777	166,630	540,310	1,229,814
2000				95,596	316,029	93,043	228,965	885,447	1,619,080
2001				51,890	132,578	188,198	155,854	853,714	1,382,234
2002		860	15,154	155,213	182,226	103,830	170,572	551,128	1,178,983
2003				57,214	118,808	449,399	234,865	729,445	1,589,731
2004				33,106	115,056	402,725	288,708	677,736	1,517,331
2005				7,231	242,078	314,184	194,556	791,709	1,549,758
2006		1,466		18,027	217,464	231,238	162,982	644,920	1,276,097
2007				276,316	318,157	249,137	191,549	833,817	1,868,976
2008				100,274	261,968	248,172	267,431	693,016	1,570,861
2009				213,163	358,184	210,557	151,396	398,208	1,331,508
2010				59,282	314,724	412,889	402,492	669,001	1,858,388
2011					188,757	388,670	261,716	630,899	1,470,042

Table 4. Recreational landings (numbers) of red drum by state, 1981-2011. (Source: personal communication with NMFS Fisheries Statistics Division, Silver Spring, MD)

Year	NJ	DE	MD	VA	NC	SC	GA	FL	Total
1981			601	49,630	15,054	27,319	6,323	75,244	174,171
1982					16,445	160,760	30,757	204,401	412,363
1983			2,413	32,940	81,528	104,806	56,854	344,513	623,054
1984				1,457	108,787	129,547	258,188	549,381	1,047,360
1985				0	22,077	530,110	183,837	265,185	1,001,209
1986			12,804	28,139	17,501	193,188	102,279	113,440	467,351
1987				2,186	61,100	522,420	138,062	51,225	774,993
1988				4,311	142,626	287,916	147,042	9,542	591,437
1989			1,014	12,007	62,359	127,492	51,557	34,748	289,177
1990			1,279	0	33,149	118,666	76,304	44,280	273,678
1991			2,745	17,119	38,658	125,833	162,802	102,727	449,884
1992				13,275	23,593	112,534	83,861	104,265	337,528
1993				14,005	49,493	119,189	105,710	65,140	353,537
1994				1,378	28,953	129,515	134,214	120,938	414,998
1995				3,665	88,593	202,430	134,915	96,927	526,530
1996				572	36,746	130,649	60,251	146,823	375,041
1997				1,920	8,749	129,022	39,041	75,235	253,967
1998				13,070	114,638	46,509	24,929	107,982	307,128
1999				12,425	64,739	44,069	67,283	126,180	314,696
2000				22,603	61,618	37,217	94,144	191,070	406,652
2001				6,967	23,142	61,420	90,376	177,633	359,538
2002		275	5,521	49,795	42,541	41,190	90,993	119,010	349,325
2003				13,607	25,481	162,484	122,259	159,331	483,162
2004				5,190	30,315	134,001	140,075	164,170	473,751
2005				2,624	53,268	141,023	107,970	196,235	501,120
2006		901		15,058	51,522	72,488	82,269	149,756	371,994
2007				70,825	65,353	88,221	103,385	199,159	526,943
2008				27,291	56,733	109,332	142,933	164,265	500,554
2009				63,513	73,446	82,855	82,294	98,232	400,340
2010				15,911	70,071	154,036	253,463	142,836	636,317
2011				1,360	42,456	147,798	120,876	159,469	471,959

Table 5. Recreational alive releases and dead discards (numbers) of red drum by state, 1981-2011. Dead discards are estimated based on an 8% release mortality rate. (Source: personal communication with NMFS Fisheries Statistics Division, Silver Spring, MD.)

Year	NJ	DE	MD	VA	NC	SC	GA	FL	Total	Dead Discards
1981					2,230	417		9,042	11,689	935
1982						2,496	3,377	10,172	16,045	1,284
1983					1,866	6,751	1,417	54,723	64,757	5,181
1984					2,931	0	4,232	47,196	54,359	4,349
1985				1,115		16,688	6,315	193,399	217,517	17,401
1986				7,595		24,018	56,045	100,095	187,753	15,020
1987					18,499	82,595	234,676	377,959	713,729	57,098
1988				3,958	24,874	269,176	177,319	233,988	709,315	56,745
1989			2,918	7,038	7,566	42,824	71,162	172,303	303,811	24,305
1990			0	934	12,452	102,611	156,263	68,667	340,927	27,274
1991			4,432	14,461	121,178	99,968	92,803	645,773	978,615	78,289
1992	301			15,383	60,230	46,269	128,066	284,893	535,142	42,811
1993				50,434	182,301	146,324	140,386	465,656	985,101	78,808
1994				10,684	107,662	324,706	146,039	691,261	1,280,352	102,428
1995				33,560	164,520	362,844	356,618	683,706	1,601,248	128,100
1996				2,424	35,752	176,517	71,983	500,374	787,050	62,964
1997		2,571		109,754	259,570	175,772	22,736	560,559	1,130,962	90,477
1998			2,768	93,660	199,701	84,274	33,882	481,009	895,294	71,624
1999			2,148	232,893	247,146	87,776	18,586	565,981	1,154,530	92,362
2000			1,458	196,541	203,967	94,050	129,190	693,152	1,318,358	105,469
2001				30,365	238,552	221,045	249,892	850,044	1,589,898	127,192
2002		1,388	18,412	801,239	640,857	142,931	168,902	663,879	2,437,608	195,009
2003		731	2,935	43,379	75,561	430,052	272,897	748,765	1,574,320	125,946
2004		86		33,594	194,627	401,234	165,802	1,137,541	1,932,884	154,631
2005				30,968	319,322	491,526	330,581	1,271,041	2,443,438	195,475
2006		1,007	11,282	159,178	461,810	607,379	148,120	893,781	2,282,557	182,605
2007				166,223	444,739	537,007	191,737	897,092	2,236,798	178,944
2008		236	258	237,940	621,609	524,234	365,257	821,996	2,571,530	205,722
2009			7851	224,234	410,202	684,156	237,765	647,583	2,211,791	176,943
2010			1814	42,584	548,411	641,916	532,890	1,152,396	2,920,011	233,601
2011				43,675	210,692	628,744	165,402	892,673	1,941,185	155,295



Atlantic States Marine Fisheries Commission

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MEMORANDUM

August 1, 2012

To: South Atlantic State-Federal Fisheries Management Board

From: Spot Plan Review Team (Danielle Chesky, Chair)

Subject: Spot Triggers for 2011 – Did Not Trigger

The Spot Plan Review Team met June 20-21, 2012, and reviewed the Spot Management Triggers, as included in the Omnibus Amendment, for the 2011 fishing year. Although the Maryland Chesapeake Bay Seine Survey Index fell below the 10th percentile, the management trigger was not tripped, as none of the other four trigger indices fell below the 10th percentile. However, the commercial landings for spot have dipped below the 10th percentile five of the past seven years, and this year's value was just above the trigger mark (11th percentile). This value continues an overall decreasing trend in commercial landings over the past decade.

The Spot Plan Review Team remains concerned about the trend seen in the commercial landings data; however, the other two fishery-independent indices (NMFS Survey, 97th percentile in 2011, and SEAMAP Survey, 91st percentile in 2011) have generally remained above the trigger mark in the past decade. **The Plan Review Team does not recommend management action at this time but recommends the Board review the trigger data mid-year, rather than wait until compliance reports are due November 1.** This approach will allow identification of any significant management issues in time to address them for the following fishing year, minimizing delay in implementation.

M12-056



Atlantic States Marine Fisheries Commission

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MEMORANDUM

August 1, 2012

To: South Atlantic State – Federal Fisheries Management Board
From: Danielle Chesky, Fishery Management Plan Coordinator
Subject: Black Drum Public Information Document – Public Comment

The following pages represent the comment received by ASMFC by July 25, 2012 on the Black Drum Public Information Document.

A total of 4 written comments have been received, all of which came from individuals.

Four public hearings were held, one each in New Jersey, Delaware, Virginia, and North Carolina. Nine individuals, combined not including staff, attended the hearings.

In summary, the written comments support moving forward with coastwide management. Specific recommendations vary by region. Within Delaware Bay, comments supported a lower trip limit, especially during the spawning fishery that occurs in the spring and early summer. These individuals expressed concern over the waste observed in the fishery and the decrease in the fishing opportunities over the past years, especially in the New Jersey portions of Delaware Bay. One individual expressed concern that release methods were not being properly performed, leading to additional mortality of released spawning fish. One individual supported a slot limit. While some individuals supported raising the size limit, along with one individual supporting a slot from 30-48", one individual opposed raising the size limit as doing so would eliminate the fall fishery that is less popular but can occur in the Delaware Bay.

The one set of comments from outside Delaware Bay encouraged implementation of a bag limit, size and/or slot limit, and limited entry for a commercial fishery. The slot range included 14-28", although the individual did support retaining some measures for the large drum fishery that occurs in the mid-Atlantic states. The individual also expressed concern for bycatch of black drum in the commercial and recreational fisheries, especially of small black drum. This individual supported measures that would allow black drum to obtain larger sizes and provide for a fishery targeting large black drum (3-10 pounds).

M12-057

Public Hearing Summaries

Delaware Black Drum PID Public Hearing

Tuesday, June 12, 2012, 7pm

DNREC Auditorium

Dover, DE

1 Public Attendee

Meeting Staff: Stew Michels (DNREC), Jordan Zimmerman (DNREC), Danielle Chesky (ASMFC)

The public member indicated black drum used to be far more abundant in the Delaware Bay area, on both the Delaware and New Jersey side. The individual supported regulations to protect the younger and the older breeding stock of black drum. The public noted the need to protect the population along the coast, if it was indeed migratory. The public expressed concern about the potential impact of the commercial fishery but was not certain as to how large of an impact the commercial fishery would have, due to the small market for the fish. The public supported continued development of an interstate management plan, in order to provide protections for black drum in all states.

North Carolina Black Drum PID Public Hearing

Monday, July 9, 2012, 6pm

NC DMF

Morehead City, NC

4 Public Attendees

Meeting Staff: Louis Daniel (NCDMF), Michelle Duval (NCDMF), Ray Mroc (NCDMF), Chris Stewart (NCDMF), Meredith Wilson (NCDMF), Danielle Chesky (ASMFC)

The public member indicated the black drum fishery is not a targeted fishery, generally, but rather a bycatch fishery when fishing for other species like sheephead. His experience has been that catch is usually incidental and very small fish. Larger fish, in schools, have been seen when fishing off of piers or other structure. Most of those that people keep are hand-sized, and as there is no size limit or bag limit, he has seen people keeping buckets full of black drum. He also noted that larger fish, 14" and larger, have been seen around the Pfizer docks near Cape Fear. Although black drum are fairly hardy fish, he thought the catch and discarding of the smaller ones likely lead to high level of mortality. That said, he supported a size limit and a bag limit, and there was some interest in a slot limit to protect the big ones, should they ever come through the area.

Virginia Black Drum PID Public Hearing

Tuesday, July 10, 2012, 6pm

VMRC Auditorium

Newport News, VA

No Public Attendees

Meeting Staff: Rob O'Reilly (VMRC), Joe Grist (VMRC), Renee Hoover (VMRC), Joe Cimino (VMRC), Danielle Chesky (ASMFC)

New Jersey Black Drum PID Public Hearing

Thursday, July 12, 2012, 7pm

Galloway Township Library

Galloway Township, NJ

4 Public Attendees

Meeting Staff: Russ Allen (NJDFW), Roy (NJDFW), Jason Hearon (NJDFW), Adam Nowalsky (ASMFC Commissioner Proxy), Danielle Chesky (ASMFC)

One public attendee submitted written comment at the meeting. Public attendees agreed that few if any drum are seen north of New Jersey. There was also agreement that the smaller ones are seen in the creeks and marshes, whereas the larger ones are seen further out into Delaware Bay. Most agreed the fishery occurs at night, but that there has been an increase in fishing for the drum during the day in recent years. Some individuals believed this was not due to an increase in the black drum population but rather a realization by folks fishing for striped bass with clams (mostly in Great Bay) that black drum would bite on these bait during the day.

Due to the majority of the fishery occurring at night, the public agreed that there needed to be better sampling of the fishery. Most agreed that, when fishing the spawning drum in the spring, one fish is enough. The season for fishing big spawners in the spring in Delaware Bay runs roughly from April 15 to June 15, with smaller fish available in other months although not heavily targeted. Those that only fished for drum in the spring argued that a higher size limit would be good. One individual, who fishes for drum year round, did not support a higher size limit, as these fish generally tend to be smaller fish around the size limit (16"). A higher size limit would eliminate this smaller drum fishery that can occur during the rest of the year. All were concerned with the lack of regulations in North Carolina and supported having some minimum coastwide size and bag limit. There was some interest in a slot limit, with limits to keep one within the slot and one trophy fish. There were concerns that just a slot limit would lead to high discard mortality of large spawners that are fought for a long time.

Folks agreed the spring spawning fishery was very poor in 2012. They thought this might be due to the warmer temperatures over the winter, which could have caused a shorter and maybe earlier spawning season. They noted colder winters tended to prolong the spawning season.



(Subject: Black Drum PID)
bhallman to: dchesky

05/30/2012 02:32 PM

History:

This message has been replied to.

In Delaware Bay, NJ and Delaware I am concerned that there is far too much killing and that the release methods used are not effective and that many if not most of the releases result in death of the Drum. These are older spawning fish that take a long time to grow to spawning age. A one fish limited is recommended.

Bill Hallman

215-245-2780 Office

215-512-9314 Cell

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The state of New Jersey is planning to increase the size limit of Black Drum Fish to 32". A group of charter boat captains from Cape May are taking credit for giving the state this idea in 2007. This size limit has little effect on them because they only fish the Delaware Bay spring spawning run of big Drum. If this law passes guys like me and others who fish for smaller 10 to 20 lb resident Drum in the summer and fall will be the only people in the country who cannot take a 16" Drum. These smaller 16" to 28" Drum are caught surf fishing and in back bays throughout the state. It looks like a special interest group may take control of all of the Drum Fish in the state.

There is a proposed 2 fish limit that I have no problem with. The size limit should stay at 16". I think it makes more sense to take a smaller fish than a big spawner. The smaller fish are better eating as the large fish have course flesh and usually carry spaghetti worm parasites.

The biggest size limit in the country is 16". The 16" size limit was put in place in NJ because South Jersey fish markets were loading up with baby 8" to 12" Drum and calling them Sheepshead or Sergeant Majors. This problem has been fixed by the 16" limit. Why should we be the only state in the nation that cannot keep a 16" Drum??? Why should we have the toughest Drum Fish regulations in the country or maybe the Western Hemisphere? Many of the Drum Fish in the country are spawned in the Delaware Bay and migrate south in the fall. We supply much of the South East with Black Drum and we should have the same access to them as the rest of the country. We are already saddled with too many regulations and this 32" limit is one too many.

The Cape May Charter Boat Captains who are taking credit for coming up with this 32" size limit only fish the spring spawning run of big fish. The rest of the year they fish in the ocean or come in the bay for flounder. This 32" limit does not affect them at all. They do not fish the summer and fall run of smaller Drum and probably do not even know about it. I do not know if they are aware of the Drum Fish laws in other states.

The Black Drum Fish laws in the rest of the states vary greatly to say the least. Here is the short version of the Black Drum Fish laws in other states.

Delaware---16", 3 per person per day.
Maryland---16", 1 per person per day.
Maryland Bay---16", 1 per person per day, 6 per boat.
Virginia---16", 1 per person per day.
North Carolina---UNREGULATED
South Carolina---14" minimum 27" max, 5 per person per day.
Georgia---10", 15 per day.
Florida---14" to 24" with one over 24", 5 per day total.
Alabama---UNREGULATED
Mississippi---UNREGULATED
Louisiana---16" to 27" with one over 27", 5 per person per day.
Texas---14" to 30", 5 per person per day.

Captain Ed Holtzhauser
Gibbstown NJ



History: This message has been replied to.

Danielle,

First of all, thank you for doing such a thorough job at the hearing. I can't tell you how excited I am that something is being done to actually regulate this wonderful fish (or – at least regulate it in NC).

I want to apologize for being the only stake holder there – I am quite embarrassed that this community did not have a better showing to give perspectives and experience. I also want to apologize for it being so awkward as me being the only stake holder there and I get nervous speaking in public particularly when the crowd is just my wife (Katie Latanich – Fisheries Forum – who knows so much more than I do of fisheries science/policy) and NCDMF director Louis Daniel who I don't often agree with. But I digress – I'd like to submit some comments to you with them fresh in my mind.

If you did not catch it in the meeting – I am a full time fishing guide and have been working as such for almost 10years. The vast majority of my fishing takes place in state waters (Within 20 miles, but probably 80% within 3 miles)) and the backwaters estuaries.

Tonight's showing is a clear example of what black drum mean to fishermen in NC – nothing as the fishery stands now. The commercial fishery is primarily tiny fish that bring next to no value and are sold against spots and hogfish in predominantly rural fish markets and inner city areas. I cant quantify that statistically but can only speak from experience as well as my general knowledge of continually talking about fisheries, the management, etc. To recreational fishermen they are nothing but occasional bycatch.

Black Drum need management in NC – they needed it 10, 20 years ago. Our lack of a minimum size restriction and/or bag limit is simply embarrassing. If you study the black drum biomass in NC and do not determine that the fishery is massively overfished with over-fishing occurring I will be utterly shocked. I believe them to be completely depleted with our landings only being the “mining” of the good year classes, cathing the vast majority prior to them hitting 15”.

I also want to reiterate that this is a prime example of NC fisheries management – NC will not (ultimately the rightfully maligned NC Marine Fisheries Commission), and has proven this so many times, take any sort of management action unless they are utterly forced to by the ASMFC. It is my belief that the ASMFC should come up with the management thresholds, size limits, etc and FORCE it on North Carolina. Otherwise the NC Marine Fisheries Commission simply will not address the issue. Or, to put it bluntly – any restriction that is implemented will be so liberal as to not effect any fisherman (particularly commercial). In their lack of progressive or adaptive actions, I believe North Carolina has long ago forfeited its right to manage their black drum. Let the ASMFC handle it, entirely.

This needs to be done quickly, as well. In NC our estuarine state fish are in dire straits – our southern flounder are depleted/overfished with overfishing occuring (with an FMP that did NOT even try to end it!), our small “slot” red drum are absent due to several poor year classes in a row, etc – many fishermen are moving over to Sheepshead as the only reliable nearshore fish to catch. If something is not done soon, the next year class will take a huge hit....and we'll be even farther behind,

As for what we need? There should be some sort of Limited entry into the commercial fishery – the state of NC will not do this, they have proven this over and over. We have 7500 commercial licenses with only approx 3500 recording any landings – each license allows a holder to use any commercial gear allowed in state waters. Virtually zero limited entry. NC, such as with red drum and striped bass, will develop into a healthy bycatch fishery (aka lucrative enough to target). If steps are taken to bring these fish back – there will be a gill net bonanza. Since so many of our commercial license holders are part-time, any fishery seeing improvement can and does become a “cash on the side” enterprise. I know a lot of state/county/federal employees in the area that do this right now as well as folks like construction workers looking to make a few easy extra bucks on the weekend. Aka - “beer money” commercial fishermen.

If our fishery is not limited entry and becomes a bycatch fishery, it will end up like the weakfish bycatch allowance which was being abused by NC commercial fishermen (and probably still is). OR, without strict measures, we will see massive numbers of dumped bycatch. I cannot tell you how many tiny gray trout I see dumped over by shrimp trawlers in Oct/Nov. Still, every year. Even with them being in such a depleted state.

This goes for recs too – NC has absolutely no culture of eating the big (and pretty much absent) big black drum. We have no need to foster a new fishery – some sort of 14-28” (just throwing out numbers here – anything under 14 is reallllly little) slot with 2-4 fish would be more than ample.

I am willing to accept that the eastern shore of MD has a big culture of eating the big black drum – I hope a fair and equitable management measure can retain that fishery.

As a fishermen – right now - I see black drum in 3 sizes

1) Tiny little sub 12” fish – the vast majority.

a) They are caught in massive numbers by spot/croaker fishermen – which, to be honest are typically of the type of angler that is out to kill as many small panfish as possible. IF you not are not familiar with spot fishing in NC – come visit in Sept or Oct or Nov and see the literally hundreds of boats fishing in the intercoastal waterway for the small panfish. With croakers now being depleted in NC and spots being a mere shadow of their once former glory, I imagine tiny black drum are taking a large hit. (If a size limit is enacted - a small public service campaign of flyers at piers/boat ramps, et al and LEOs writing tickets could solve this problem quite quickly).

b) There is obviously some sort of commercial fishery for these fish – probably in the small mesh gill net fishery of which they are sold as bycatch or discarded in BIG numbers. This will continue until NC determines that the destructive gill net fishery needs to either go or change it dramatically.

2) Medium 2-5lb fish, rare to 8lbs, extremely rare to 12lbs. These I catch while sheepshead fishing with crab or with live shrimp for speckled sea trout. On the years they are more abundant I will target them if they are around in any sort of capacity. (only 1 of the past 5 years comes to mind where I could target them to catch more than 2 or 3 to every 20 sheepshead). Extremely good eating fish – also annoying that some clients will want to keep tiny sub 12” fish because they can. I try to discourage it but having a law saying such would be easier.

3) Large 30lb+ - occasionally seen caught by surf fishermen in Nov and every year or two a big school or such will be spotted at cape lookout traveling north (a few hundred yards off the beach). Extremely rare

sight. Ive seen a few released but most are killed and then discarded as “inedible due to worms.” The later is obviously not true but keep in mind that NC anglers, as a whole, also discard greater amberjacks as “inedible due to worms” while the same fish are HIGH dollar in the gulf.

What sort of fishery would it be nice to see? How about a reliable few fish in the 3-10lb class every year? Knowing that a few may reach spawning size? Maybe even a few giants staying around NC all year? It has to be at least possible. Right now, I can cross the boarder into SC and a mere 3 miles from the NC line we can find 10lbs tailing in 1foot of water. Here in NC? Not at all – I spend 120+ days per year poling my flats skiff for red drum in NC, in the exact same habitat, and see a mere 2 or 3 4lb black drum a year. Fishing in FL? We saw huge numbers of black drum – all sizes. Fishing in Lousiana? They are everywhere. All those states have slot limits, bag limits and no estuarine gill nets.

If I think of anything else I will send you another email – thanks again for the meeting and if you have any questions I would be happy to answer any you have,

Tom Roller

--

Capt. Tom Roller

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History: This message has been replied to.

I would like to comment on the proposed black drum regulations.

Several years ago we had a thriving black drum fishery in southern New Jersey in the Delaware Bay. We are currently fishing under regulations that allow 3 drum per person over 16 inches. As a result of these regulations, the stock was severely depleted by the charter and recreational fleet. It was not unusual back then to catch 10 to 30 drum on an outing. Many boats kept their allowable limit. Docks were littered with carcasses. Many fish went to waste.

The current situation is that many trips yield zero fish. Some trips yield a few, albeit smaller fish. It was with great dismay that I witnessed this destruction of a fishery. Black drum come into the Delaware Bay and spawn and their aggregations were heavily fished by boats. Some days one could witness over 500 boats fishing for this species. It was such a shame that a better FMP was not in place. I am encouraged to see a plan being developed to preserve the stock. My research on black drum populations reveals that the main cause of population fluctuations in this fishery is due to overfishing.

As you are aware, the basic concepts of species preservation are:

1. Protect the spawning population
2. Ensure enough juveniles to replenish the spawning stock
3. Provide for environmental conditions conducive to species survival.

As these fish spawn in the lower bays, the environment is healthy due to constant tidal interchange of waters. Juveniles are well protected by the size limit and are in fact rarely fished for in our area. Thus the main area of concern is that destruction of the breeding population. I would suggest the following which has been well documented in rebuilding the red drum (redfish) species:

Maximum: 1 fish per person
Size limit: 30 to 48 inches
No season closure is necessary

The commercial harvest in New Jersey is 60,000 pounds which is way too many fish being killed. I would suggest lowering it to 10,000 pounds till the stock is rebuilt. There is little commercial activity on these fish anyway.

Respectfully submitted

Dr. (Captain) Harvey Yenkinson

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